

Rhodora

JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 47.

April, 1945.

No. 556.

CONTRIBUTIONS FROM THE GRAY HERBARIUM
OF HARVARD UNIVERSITY—NO. CLVI

BOTANICAL SPECIALTIES OF THE SEWARD FOREST AND ADJACENT AREAS OF SOUTH- EASTERN VIRGINIA¹

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(Plates 876–911)

PART I. TWO VISITS TO THE SEWARD FOREST IN 1944

Dr. Alfred Akerman, Director of the Seward Forest, and Mr. J. B. Lewis, Naturalist of the Forest, most kindly renewing invitations for me to return for study of the local flora at seasons different from those when I had visited the area in October of 1942 and in April, 1943, I gladly returned on June 19, 1944, for a week of local exploration. Lewis had been saving his gasoline-coupons against our needs but, naturally, we could not go far from Triplett, although we did get one trip, specially seeking further limits of range of *Asarum Lewisii* Fernald in RHODORA, xlv. 398, plates 774 and 775 (1943), as far as Poplar Creek, draining into the Roanoke in southwestern Brunswick County. We did not need to go far for interesting returns, for within the limits of Seward Forest and the immediate vicinity of Triplett there was plenty to occupy us. The fruit of *Rubus* was ripening and, since some of the species of this region of the outer Piedmont were quite unlike those I knew on the Coastal Plain, I made a point of securing a good series (and of testing the fruits). There

¹ The cost of plates defrayed through grants from the AMERICAN PHILOSOPHICAL SOCIETY and from the DEPARTMENT OF BIOLOGY OF HARVARD UNIVERSITY.

are several strikingly different species. Some of these will be discussed in Part II.

As we drove from the train, at Emporia, to the Seward Forest, Lewis said, "Don't forget to remind me to show you a strange *Baptisia* when we get to Philadelphia Church. It's the only colony I ever saw of it". So, when we got to the locality we stopped and I promptly said "*Baptisia tinctoria*". "But the flowers are so small. What I know as *Baptisia tinctoria* has larger flowers and leaves". It is the typical Coastal Plain extreme, the plant separated by Small as *B. Gibbesii* from "Sandy woods, Coastal Plain, S. C.", although, as I showed in RHODORA, xxxix. 414 (1937), *B. Gibbesii* is a close match for the type of *B. tinctoria* (L.) R. Br., while the common inland and northern plant, with which Lewis had been familiar, is the usually coarser *B. tinctoria*, var. *crebra* Fernald, l. c. Since I had just sent for issue in RHODORA, xlvi. 281 (1944) a note by Dr. Robert Clausen, in which he expressed the opinion that "Var. *crebra* . . . seems scarcely tangible", Lewis's unsolicited tribute to its worth was interesting. Certainly, nowhere else in the region have I seen anything so small-flowered and -fruited as the colony near Philadelphia Church.

This intrusion into the upland flora of the Piedmont in Brunswick and western Greensville Counties of plants more characteristic of the Coastal Plain was emphasized by me in my last paper on the Virginian work¹; and now, again, we met at almost every turn a singular mixture of inland or upland species (sometimes specialties of the Appalachian Upland or of the Mississippi Basin) and those which are primarily on the Coastal Plain, although, naturally, only a few of the latter have intruded so far inland. In fact, the first plant I collected after getting into old clothes, the everywhere abundant representative of *Rubus* § *Cuneifolii*, was at once impressive on account of the 5-foliolate leaves of the primocanes, with very narrow leaflets. To me it seems a close match for *R. sejunctus*, described by Bailey from material collected by Long and me near Branchville, 30 miles to the east and well out on the Coastal Plain in southern Southampton County—there also on Meherrin drainage.

¹ *Virginian Botanizing under Restrictions*, Contrib. Gray Herb. no. clxix. RHODORA, xlv. 357-413, 445-480, 485-511 (1943)—especially pp. 374-377.



Photo. B. G. Schubert.

CYPERUS VIRENS: FIG. 1, TYPE, $\times \frac{1}{2}$, after *Cintract*; FIG. 2, spikelets, $\times 10$, from fig. 1; FIG. 3, two inflorescences, $\times \frac{1}{2}$, of *C. pseudovegetus*, FIG. 4, spikelet, $\times 5$, from fig. 3
 C. ROBUSTUS: FIG. 5, spikelet, $\times 5$

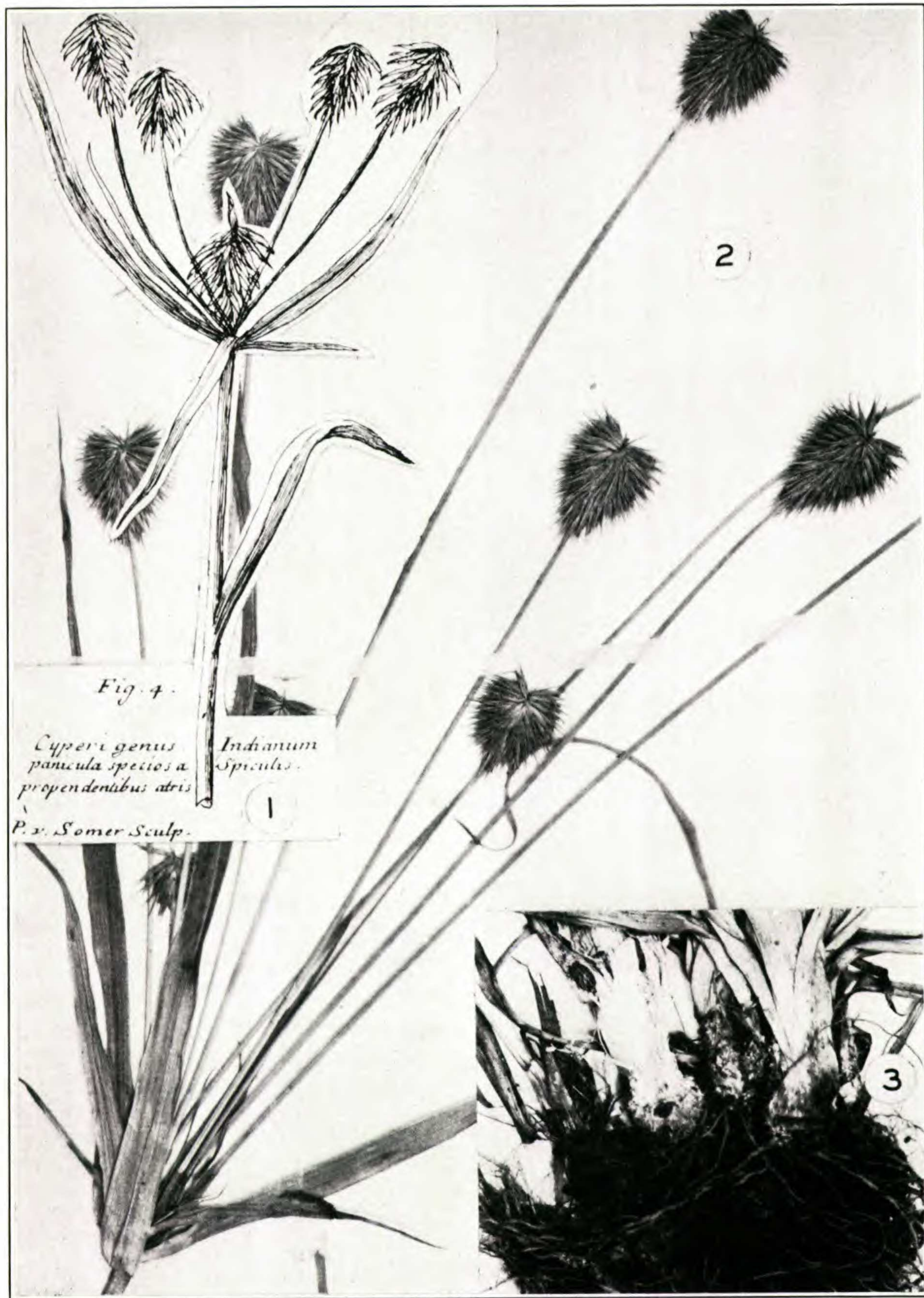


Photo. B. G. Schubert.

CYPERUS PLUKENETHII: FIG. 1, Plukenet's figure of a plant from Virginia; FIG. 2, inflorescence of TYPE, $\times 1$; FIG. 3, characteristic base, $\times 1$

Two stations, one of them within the Seward Forest, the other barely not, are specially noteworthy. The most distinctive is the little spring-fed and (originally) *Sphagnum*-carpeted Magnolia swamp, which is called the "Ram-hole" or "Ram-hole Swamp", because of the ram once installed for pumping the spring-water. I have previously noted it and in September it yielded more than its share of Coastal Plain specialties. In June, however, these were scarcely evident, the most notable plant then being a long-arching and doming blackberry such as I had never met, but which proved to be characteristic across the county, even to its southwestern corner, and eastward into Greensville County. Since it is so characteristic of the Seward Forest and its vicinity I shall describe and illustrate it (PLATES 890 and 891) in Part II and there take the liberty of naming it for the Director of the Forest, although, if he could discover it, he would doubtless prefer his name to be associated with a new tree! Further discussion of "Ram-hole Swamp" will be deferred until I record the September trip.

The area which in June had the greatest mixture of upland and Coastal Plain types was the "Moseley flat pineland"¹, near Triplett. It was here that Lewis had found *Cynoctonum sessilifolium* (Walt.) J. F. Gmel., at the only known station north of the savannas of the Coastal Plain of North Carolina, and *Hypericum setosum* L., a characteristic southern species already known very locally from the Coastal Plain of Virginia, forty-five miles away. Here in June the most striking plant was a *Fimbristylis*, forming dense and tough hassocks, with many already fruiting tufts arising from bulbous bases crowded on the stout and short rhizomes. This was new to me (also to Virginia). Its identification has necessitated a prolonged study of its section of the genus, which will be detailed in Part II. Briefly, it is *F. Drummondii* Boeckl., described from New Orleans but found (though commonly misidentified) in pine or oak barrens, on sterile meadows, prairies, etc., from Florida to eastern Texas, northward, very locally, to Long Island, and, more generally, in the Interior to southern Michigan, Illinois and Missouri. With it, and giving further inland atmosphere to the spot, was *Psoralea psoraloides*

¹ The labels for this station got printed "mostly flat pineland". If any of them chanced to be distributed without correction, the error should be noted.

(Walt.) Cory, var. *eglandulosa* (Ell.) F. L. Freeman, widely dispersed from interior Georgia to eastern Texas, northward to the upland of North Carolina and to Ohio, Indiana, Illinois, Missouri and eastern Kansas, with its only previously known Virginian station in similar flat pineland at McKenney, 25 miles to the north, in Dinwiddie County. And with these two characteristically inland plants *Juncus Longii* Fernald in RHODORA, xxxix. 397, pl. 777, figs. 1-4 (1937), and *J. scirpoides* extended inland from the Coastal Plain, and the common Coastal Plain *Scleria pauciflora* formed loose tussocks. Near the margin of a small branch which borders this flat pineland I was puzzled by a very lax *Carex* with the flaccid culms loosely arching, so that the inflorescences lop to the ground. We had never had it in southeastern Virginia, but it proves to be the chiefly inland *C. hirsutella* Mackenzie. The "Moseley flat pineland" is an interesting tract.

The day we visited the Roanoke drainage in southwestern Brunswick County we drove directly to Ebony, where we made the first stop. Near there a bit of undisturbed swaley thicket looked promising. Here was the long-arching new *Rubus* of the "Ram-hole Swamp", 12 miles to the northeast; and when, another day, I got it in abundance near Brink in Greensville County, thus demonstrating its occurrence over a belt at least 20 miles across, it was evident that I was dealing with a true species, not merely a clone. The *Rubus* leaned out of a clump of the unusual form of Willow-Oak, *Quercus Phellos*, with the lower leaf-surfaces white with fine silk, forma *intonsa* Fernald in RHODORA, xliv. 392 (1942), typical and abundant *Q. Phellos* having the leaves green and glabrous on both sides. And here, almost in Mecklenburg County and 120 miles inland from the coast, where true *Juncus dichotomus* occurs, was the very different species, which elsewhere pushes inland and which passes as a mere flat-leaved variety of that coastal species, *J. dichotomus*, var. *platyphyllus* Wiegand. Its specific claims will be discussed in Part II.

Poplar Creek, emptying into the Roanoke, has good bottom-land woods, with an abundance of *Acer floridanum* and its very definite var. *Longii* Fernald in RHODORA, xliv. 426, pl. 726 (1942), the latter previously known only from calcareous slopes to the

lower James in James City County, ninety miles away. Beneath them was a fruiting *Aesculus*. Without flowering material I balk at naming it. *Geum canadense*, var. *brevipes* Fernald in RHODORA, xxxix. 410, pl. 479, figs. 1-3 (1937), supposed to be endemic on the bottomlands of the Nottoway, forty-five miles to the northeast, in Sussex County, abounded. It presumably will be found along the Roanoke in North Carolina. So, likewise, will be *Boltonia caroliniana* (Walt.) Fernald in RHODORA, xlii. 487, pl. 642 (1940), of southeastern Virginia and the lower Santee Valley of South Carolina, for here, on Poplar Creek, it is almost in North Carolina and far inland from its center on the Coastal Plain.

The "Chamblis bigwoods" of the Seward Forest, a vast tract for which I learned in September to have a vast respect (having been lost there for three hours), had yielded on my two previous visits some choice and apparently isolated inland or montane plants, enumerated in the last Virginian paper: *Panicum flexile*, *Polygala Senega*, var. *latifolia*, and *Zizia trifoliata*, for instance. In June these woods were equally productive. *Festuca paradoxa* Desv. (*F. Shortii*), common in rich woods of the Coastal Plain, was here abundant, although, from the range given by Hitchcock and his map (chiefly from western North and South Carolina and northwestern Georgia to Iowa, Missouri, eastern Oklahoma and northeastern Texas), one would never guess it. *Cypripedium Calceolus* L., var. *pubescens* (Willd.) Correll, was frequent, as was the southern *Sanicula Smallii* Bicknell. Young shrubs of *Nyssa* produced puzzling atypical leaves and I stumbled upon a few straggling shrubs of *Castanea neglecta* Dode, supposed by some to be a hybrid of *C. dentata* and *C. pumila*, but here, as in calcareous woodlands farther east, where it occurs, *C. pumila* would be out of place and *C. dentata* of acid woodland would scarcely have thrived. But the great excitement was a knoll in rich woods bordering the swamp along Quarrel's Creek, a slope covered with abundant *Sanicula Smallii*, *Carex oxylepis* and other species of rich southern woodland. On this knoll the leaves of a low *Circaea* were of a pale yellowish green, the margins of the rounded-cordate blades undulate, the pedicels purple-based, the sepals somewhat villous on the back, the tiny fruits as in the northern *C. canadensis* Hill (*C. intermedia* Ehrh.).

Outside of Europe *C. canadensis* is known from the Gaspé Peninsula of eastern Quebec to Lake St. John, and south to Nova Scotia, southern Maine, southern New Hampshire, western Massachusetts and Connecticut, New York and upland West Virginia. Its associates are northern, not southern species. We as yet know the little plant of Seward Forest from only this one spot. Its characters, however, justify its separation from the northern plant which, superficially, it suggests. In Part II it will be described and illustrated (PLATE 896).

Two old clearings within the area of the "Chamblis bigwoods" are, like most such habitats, largely given over to brambles (*Rubus*). Two species here specially interested me, both of them doming and forming intricate mounds, with the long and coarse overarching canes eventually trailing at tip, as in the wide-ranging plant already noted, members of my § *Tholiformes*. These were both very different from each other and quite unlike anything I can find described. One of them was in the clearings about the old Chamblis place and also in the clearing near the old Taylor place, the other was noted only in the latter locality. The former of these two abounds near an old outhouse where, in June, a brood of young turkey-buzzards very unsociably ran to a corner and tried to hide from our gaze and where, in September, they still clung to the old home. Since most descriptive specific names in *Rubus* are preempted I shall, in Part II, name this very characteristic blackberry (plates 892 and 893) for the buzzards upon whose domain we rudely forced ourselves in collecting it. The other (plates 894 and 895) I am naming for the very antithesis of a buzzard, the generous and scholarly founder of the Seward Forest, Dr. WALTER SEWARD.

I kept hearing of Quarrel's Creek and Pair's Store. These geographic names, coupled with Triplett (which our non-meddlesome government rules should be spelled "Triplet", in spite of the name of the original settler—on a tributary to Fontaine, not "Fountain", Creek), struck my whimsical sense of humor, for the combination of pairs, triplets and quarrels would intrigue even a dull imagination. So we went from Triplett to Pair's Store and thence followed down Quarrel's Creek to its junction with Fontaine Creek. Swaley open woods not far from Pair's Store looked interesting but, alas, most of the area had been

under the plow; elsewhere it had been burned. The only plant of note there was the white-flowered *Polygala sanguinea*, a form I had rarely seen. The bottomland woods had passed the interesting period of early spring and had not reached the autumnal phase which is always interesting, but at the margin of the bottomland I was delighted to come upon the first thicket of *Amorpha fruticosa*, but not the last, I had ever seen, for in a few days we found it along Fontaine Creek near Round Hill Church, also in Greensville County, but nearer the Fall Line.

On my first trip to Seward Forest we had gone to the Meherrin River at Westward Bridge (or Mill), south of Edgerton. The greatest excitement there was the discovery on the bottomland of *Muhlenbergia glabriflora* Scribn., previously known only from southwestern Indiana and Illinois to Texas. With this rather startling isolation in mind we returned to Westward Bridge. I had many times tried to cap one good discovery with another, but usually it hadn't worked. So I was prepared for the worst. Wallowing through the deep and retarding tangle on the bottom, I suddenly halted. The *Tripsacum* there didn't look right. Its slender staminate inflorescence had narrow and sharply acuminate glumes, whereas I remembered the glumes as broad and blunt. Three or four plants were taken "just in case", and this time luck was with me. I cannot separate the Meherrin River plant from an isotype and other Texan material of the recently described *Tripsacum dactyloides*, var. *occidentale* Cutler & Anderson, the variety known to them only from the Davis and the Chisos Mountains in western Texas. When in doubt take a specimen!

Lewis and Dr. Akerman again saved up gasoline, and in September it seemed possible to get about a little. So, on September 11, I reached Seward Forest. This time we conserved all possible motive power for a final day, and our longest trip away from the Forest, until I had to return to Emporia to take the night-train home, was to the Meherrin at Westward Bridge. My arrival had broken the all-summer drouth¹; consequently the muddy shore of the river, where I hoped for good things,

¹ For several summers, whenever Long and I reached our old center at Petersburg, it would begin to rain. So regularly did this occur that we were always greeted: "I knew you had come; the drouth has broken".

was drowned under more than opaque red-brown water. But the woods contained the very heavily pubescent *Elephantopus carolinianus*, forma *vestitus* Fernald, which we had known only from the bottomland of Adams Swamp, seventy miles to the east in Nansemond County; the mass of ordinary pink-flowered *Polygonum pensylvanicum* contained scattered plants with bright white flowers. The *Pycnanthemum incanum* certainly was not the northern plant with more or less divergent pubescence. Neither did it look like the southern var. *Loomisii* (Nutt.) Fernald, with the internodes and calyces densely canescent. It looked too glabrescent. At the risk of possibly overloading with material of the latter, already much collected farther east, I took a specimen. It is the extreme of *P. incanum* recently described as *Pycnanthemum puberulum* Grant & Epling, its type from southwestern Georgia. At any rate, I got one specimen! But I took twenty sheets of the next plant of note. This is *Dicliptera brachiata* (Pursh) Spreng., a very definite member of the *Acanthaceae*. Some years ago Long and I made frequent visits to the intermittently drowned bottomland of the Meherrin just before it leaves Virginia, below Haley's Bridge (between southeastern Greensville and southwestern Southampton Counties), for in early summer we had there found young foliage of a strange member of the *Acanthaceae*. Repeated or long-continued drownings delayed the identification until finally, in October, the water receded and we got the *Dicliptera* in flower and fruit. That has been the only station known in Virginia. Now, directly under the northern end of Westward Bridge, we have another.

Hoping that the once flooded but now fully overgrown bottom where the dam had gone out at old Clipper's Mill on Rattlesnake Creek, southwest of Triplett, would have some worth-while shore-vegetation, we tried there. For the most part the old bottom is a dense and very deep swale of *Pilea*, *Boehmeria* and their ilk, but here was an inland station, pretty well back from the Coastal Plain, of *Rhynchospora corniculata*, and in one area there is an *Erianthus* with peculiarly silvery and pale panicles. It didn't quite register; I had never met it growing, for it is *E. alopecuroides*, an inland species which we have not had on the Virginian Coastal Plain. Not far away, in a mossy bottom,

Dryopteris cristata, very local in southeastern Virginia, abounds, but, so far as I saw, that is the only specialty of note there.

Visiting the lower mile of Quarrel's Creek and again following down to its confluence with Fontaine Creek, we were amazed that the bottomland woods had none of the big *Compositae* we should have expected. However, as we entered the woods near the station of *Amorpha fruticosa*, we got into a tangle of *Vitis cinerea*, frequent farther down the Meherrin system on the Coastal Plain, although generally treated as western or very southern: "Centr. Ill. to Kan. and Tex."—Gray; "Indiana, southwestern Wisconsin, Illinois, Missouri, Kansas, Arkansas, Oklahoma, eastern Texas, Louisiana, Alabama, western Georgia"—Bailey, *Gent. Herb.* iii. 316. Farther down, where the often flooded bottoms by Quarrel's Creek merge with those of Fontaine Creek, we established some new inland extensions of Coastal Plain types, such as *Scirpus divaricatus*, *Juncus repens* and *Ludwigia glandulosa*. And farther up Quarrel's Creek, in the swamp where it flows through the "Chamblis bigwoods", I was delighted to find an inland colony of *Cornus foemina* Willd. (*C. stricta* Lam.). Searching near-by for mature fruit of the new *Circaea* (now completely dessicated and ruined by prolonged drouth), I was impressed by a nearly smooth creeping *Desmodium*, much smoother than *D. rotundifolium* with which it grows. It proves, according to Dr. Schubert, to be only the Coastal Plain *D. lineatum*, which, in former years, I had learned to pass without emotion. This station, very rich and damp woodland, is so unlike the relatively sterile and dry woods where I had known it that I was fooled. Beside it was another plant which registered with some doubt; so I took a couple of specimens. It is fortunate that I did so, for it is *Polymnia Uvedalia*, var. *densipila* Blake, described from Louisiana, Oklahoma and Texas; also Bermuda. That was the last important collection in the "Chamblis bigwoods".

Lewis had announced, while I was in the swamp, that it was time to start home; but very soon he commented on the shouts, like those of a woman calling, from deep in the woods. He said it was a Barred Owl, and I suppose he was right. Nevertheless, when I came out of the swamp and whistled for my companion and guide, he was gone. My masculine shouts did not interest

him; and, reasoning that he had gone on ahead and had ascribed to me a greater degree of wood-craft than I possess, especially on a rainy and sunless day in a strange and extensive "bigwood", I followed broken plants and some remembered landmarks to what I thought the proper place to break out toward the waiting car, soon got tangled and twisted around in impenetrable briars and towering dog-fennel (*Eupatorium capillifolium*) ten feet high, and, taking again to the woods, made broad circles for three hours, until, finally, by sighting on tall trees and following a straight course, I came out, rather surprised at myself, at the car. After that I carried raisins as well as a compass in my hip-pocket! As we approached headquarters a truck, with the Director and a crew, had started out as a searching-party. The whole community soon had the story, but I insisted on pretending to wonder whether the womanish calls which had lured Lewis away were really those of an owl!

Dr. Akerman wanted us to see one of the eastern extensions of the Seward Forest, in the extreme eastern edge of Brunswick County, south of Ante. As we entered the dry pines the first herbaceous plant we noticed was the essentially glabrous Coastal Plain *Tephrosia virginiana*, var. *glabra* Nutt. Then we walked through acres and acres of *Asarum Lewisii*, forming broad and open carpets to the exclusion of anything else. This, the most extensive colony yet known, is in ordinary dry or dryish woods, largely of Loblolly Pine. Here, in the spring, we may be able to secure the unknown fruit, for so extensive a colony must spread largely by seed.

I could not leave Seward Forest without spending some hours in the little "Ram-hole Swamp", so near-by that we were apt to overlook it. We already knew it as the only station yet discovered in the Manual range for the southern square-stemmed *Solidago salicina* Ell., here isolated by 100 miles from the northernmost known station in North Carolina; also as an isolated inland station for the beautiful *Lobelia glandulifera* (Gray) Small (See RHODORA, xlv. 377 (1943)), the *Lobelia* delighting in just such spots on the Virginian Coastal Plain. Unfortunately, fire has ruined much of the sphagnous carpet and inevitable brambles are rapidly monopolizing the area, but enough of the original bog remains to maintain the *Solidago* and the *Lobelia*.



Photo. B. G. Schubert.

CYPERUS RETROFRACTUS: FIG. 1, TYPE, $\times \frac{1}{3}$, of *Scirpus retrofractus* L.; FIG. 2, inflorescence of TYPE, $\times \frac{1}{2}$; FIG. 3, inflorescence, $\times 1$, of type of *C. hystericinus*; FIG. 4, rhizome, $\times 1$

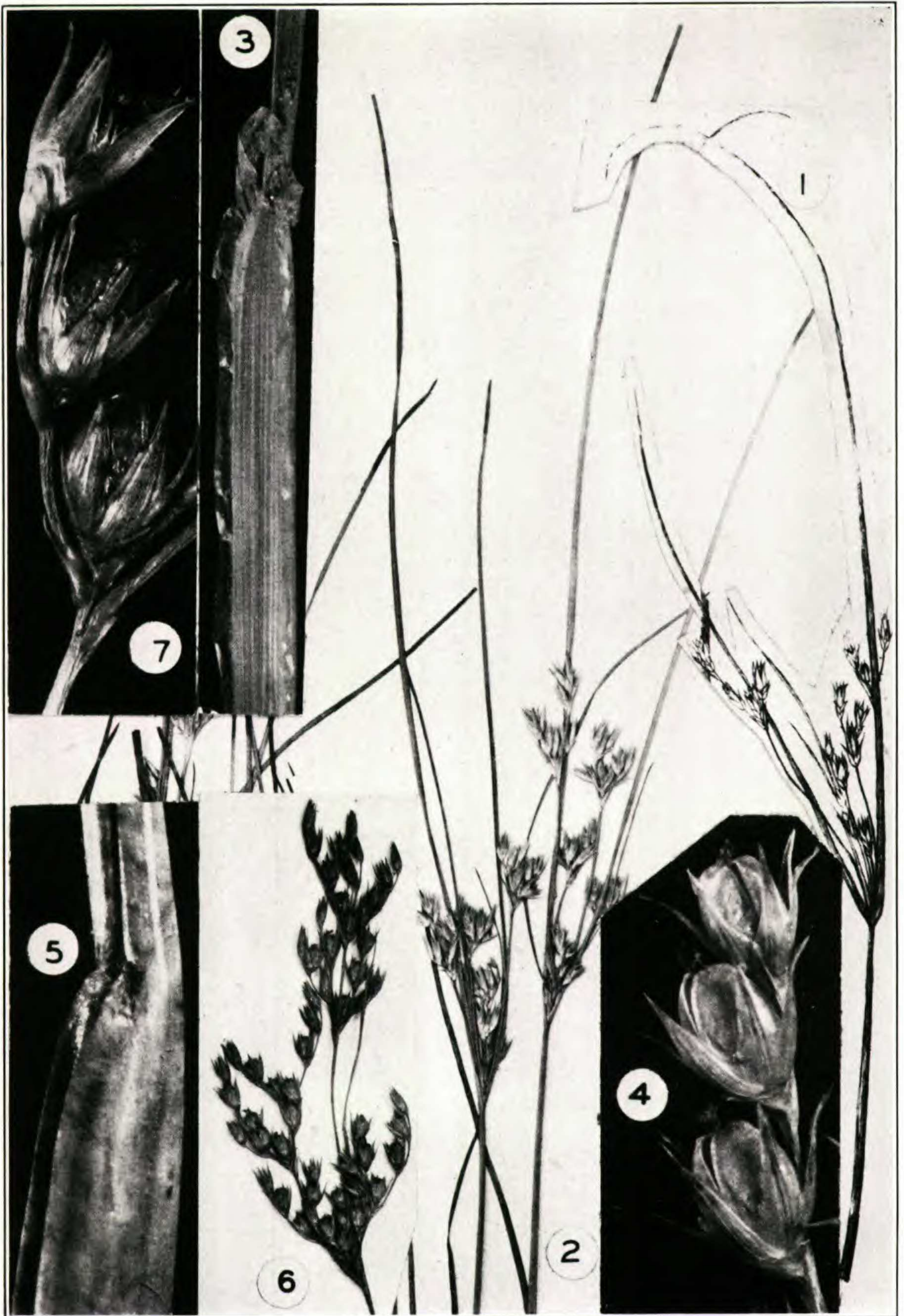


Photo. B. G. Schubert.

JUNCUS TENUIS: FIG. 1, inflorescence, $\times 1$, of TYPE, after *Rostkovius*; FIG. 2, two inflorescences, $\times 2$, of *J. macer*; FIG. 3, sheath and auricle, $\times 5$; FIG. 4, mature fruits, $\times 6$
 J. DICHOTOMUS: FIG. 5, summit of sheath and base of leaf, $\times 10$; FIG. 6, inflorescence, $\times 1$; FIG. 7, fruits, $\times 6$

In September the Coastal Plain *Helianthus angustifolius* and *Cirsium virginianum*, including the cut-leaved forma *revolutum* (Small) Fernald, abound and here we got our most inland stations in southeastern Virginia for *Rhynchospora globularis* (Chapm.) Small, var. *recognita* Gale, *Lycopus americanus*, var. *Longii* Benner, typical *Eupatorium hyssopifolium* (See RHODORA, xliv. 459), *Solidago rugosa*, var. *celtidifolia* (Small) Fernald and *Fuirena squarrosa* (*F. hispida* Ell.). The latter was tangled in and rather overwhelmed by the dominating Coastal Plain *Panicum lucidum* and a very slender but long-since overripe *Rhynchospora* which must be collected earlier another season. These are not all. A problematic low shrub of some species of *Pyrus*, subg. *Aronia*, is quite like low and simple-stemmed shrubs from pine barrens and savanna of the southeastern Coastal Plain, its identity yet to be worked out; and some other puzzles, still awaiting study, were secured. One of them, the tiniest alder I know, fruiting shrubs only 2 to 3 feet high, with scattered simple and erect stems, mature leaves only 1 to 2 inches long and very small staminate aments, cones and fruits, is like similarly dwarf shrubs once collected by Long and me in a bushy sphagnous swamp, with *Sarracenia flava* and *Lachnocaulon anceps*, in Prince George County. This is so strikingly unlike other eastern Virginian alders, that I have dug out from hiding a study of the Swamp Alders of eastern America, a study begun nearly 40 years ago but several times shelved or pigeon-holed. This I am aiming to bring to a conclusion for publication in the near future. This little remnant of a springy and sphagnous bog is one of the unique and most interesting habitats in the Seward Forest. What a place it must have been before fire (Dr. Akerman's scrupulously avoided and most dreaded foe throughout the forest) got into the place!

At last it was time to leave. It had rained intermittently through five days out of seven and, of course, we got some of the downpour at the western border of the hurricane of the period. In early July of 1943 Long and I had discovered on the sandy beach of Whitefield's Millpond, southwest of Corinth in Southampton County, very young plants of an annual which closely simulated the southern and southwestern *Eryngium prostratum*, originally described from Arkansas. The material was too

young, but its fruit did not seem quite typical of *E. prostratum*, unknown within some hundreds of miles of southeastern Virginia. In October, 1943, after a week of downpour, following months of drouth, Akerman, Lewis and I visited Whitefield's Pond in search of ripe material. But the elements were not on our side. As I wrote in my last Virginian paper: "When we got to Sedley we were told that we could not get at Whitefield's Pond from the south, for the road was completely under water and the dam itself flooded. That sounded pretty bad, and when we reached Whitefield via Corinth, there was the overflowing pond extending back into the woods. The farmer living near-by told us that in the forty years he had lived there the water had never been so low as it was until the five-day rain came on. We could have wept. Locating a spot where the little *Eryngium* should be, I walked in to shoulder-depth (I was already drenched by rain), ducked and grabbed. Nothing but floating *Utricularia* and debris came up. The *Eryngium* still evades us"—RHODORA, xlv. 390 (1943).

That defeat had been rankling for two years; and when I reached Seward Forest I had urged that we use the accumulated gasoline with rigid economy, in order to try again on the last day, before I should take the night-train north from Emporia. So on Monday, the 18th, disappointed that Dr. Akerman must give up the trip with us, Lewis and I started for Whitefield's Pond. It still rained, so hard as seriously to obscure our vision, but we figured on getting to Whitefield by 9 in the morning and then having a full day for exploration. But Fate was still not wholly reconciled to our programme. On the way to Sedley, reached by a road full of unexpected angles and forkings, we were undecided which of two surfaced forks to take. Driving up to what in the rain looked like a filling station, we suddenly went bang! bang! A rear and a front wheel were down to their hubs in rotted tar pavement! The filling station had been deserted and we were alone on a deserted road. Luckily a friendly board-pile was soon discovered and eventually we pried ourselves out. It was afternoon when we got to Whitefield. Twenty feet of beach were still undrowned. The *Eryngium*, with sky-blue flowering and paler fruiting heads, made repent mats and by rapid work we secured a splendid type-series

(PLATES 897 and 898) before the early twilight. We had finally won! There was no time for exploration of the four miles of beach and marshy shore, but while uprooting the trailing branches of the undescribed *Eryngium*, I snatched a single plant of a *Ludwigia* which looked unfamiliar. It is; I can find nothing quite like it in the herbarium, but without fuller material I withhold further comment. The carpet of *Polygonum* bordering the outlet of Whitefield's Pond looked strange: with the very narrow (almost linear) leaves and thick finger-like panicles suggesting *P. opelousanum* Riddell, but the flowers deep pink, not greenish. A hastily snatched bunch had to suffice, but the plant proves to be a very definite new variety (PLATE 884) of *P. hydropiperoides*, represented in the Gray Herbarium by an old collection of Rugel's from Norfolk County; otherwise only from the region of Wilmington in southeastern North Carolina—a geographic segregation repeated by very many plants of the Coastal Plain of southeastern Virginia. Whitefield's Pond needs close study! The next morning, September 19, in a few short hours a regular cloud-burst precipitated 6 inches of rain over southeastern Virginia and caused disastrous floods. We had got the *Eryngium*; one day later we should have missed it.

Thus the two short visits to Seward Forest, with a total of 14 half-days or one week of field-work, brought their botanical returns in unexpected number, and it is possible to close off the very brief season of 1944 with a record of discovery not at all discreditable in view of the limitations. These results would have been impossible without the cordial and genuine hospitality and helpfulness of the Director, Staff and families of the Seward Forest. My gratitude to them all is very great.

PART II. TECHNICAL NOTES AND REVISIONS

As usual in this series of papers, the more important range-extensions are briefly assembled, even though already noted in the journal. Plants thought to be previously unrecorded from Virginia are indicated by an asterisk (*) and in all except the several technical studies, the names of collectors, *Fernald & Long*, *Fernald & Lewis*, etc., are omitted, the numbers sufficing. Since, for the most part, Lewis has a separate series of numbers,

plants collected by us both and of which only my own series of numbers are available are cited as *Fernald* (with *Lewis*), etc. Some studies which have resulted from earlier collections in the state by Mr. Bayard Long and me are included; a few plants, recently recorded by me elsewhere and new to Virginia, are briefly noted, that their records may be easily available; and the last discussion, although not growing immediately out of our field-work, is here included, since most of the plants discussed are Virginians. As for several years past, I am greatly indebted to Dr. BERNICE G. SCHUBERT for her skill in preparing the plates. The cost of engraving has been met through grants from the AMERICAN PHILOSOPHICAL SOCIETY and from the DEPARTMENT OF BIOLOGY OF HARVARD UNIVERSITY.

DRYOPTERIS CRISTATA (L.) Gray. BRUNSWICK Co.: bottom-land woods near old Clipper's Mill, southwest of Triplett, no. 14,680. Not recorded by Massey from Brunswick Co. See p. 101.

FESTUCA PARADOXA Desv. Local range extended inland to BRUNSWICK Co.: low woods along Meherrin River near Westward Bridge (or Mill), no. 14,554. Seen in other rich woodlands. See p. 97.

VULPIA Elliotea (Raf.), comb. nov.? *Festuca quadriflora* Walt. Fl. Carol. 81 (1788), not Honkeny, Verz. Aller Gew. Teutschl. 268 (1782). *F. monandra* Ell. Sk. i. 170 (1816), in obs. on misapplied name *F. myuros* L., the full description being of the indigenous plant of S. C. *Dasiola elliottea* Raf. Neogen. 4 (1825). *Festuca sciurea* Nutt. in Trans. Am. Phil. Soc. n. s. v. 147 (1835). *V. sciurea* (Nutt.) Henrard in Blumea, ii. 323 (1937).

The earliest available name for this characteristic American (including Virginian) species is *Dasiola Elliottea* Raf. (1825), Rafinesque defining the new genus *Dasiola* with the single species *D. Elliottea* based on the very fully described *Festuca monandra* Elliott. Elliott's description is unequivocal; he called the plant the Old World *F. myuros* L., but said "I once considered this plant as distinct from the Linnaean *F. myurus*, and named it *F. monandra*; the description however of Lamarck . . . renders it probable that it is the same: the only circumstances which still occasion any doubt, the hairy corolla and solitary filaments, are omitted in his description". The hairy "corolla" is distinctive of the native southern plant; and this comment, as well as Elliott's full account, leaves no question as to the identity

of his plant, therefore of Rafinesque's *Dasiola Elliotea*. Elliott's *Festuca monandra* can not be taken up. He published it only as a *provisional* name which he had himself abandoned.

V. OCTOFLORA (Walt.) Rydb., var. **tenella** (Willd.), comb. nov. *Festuca tenella* Willd. Sp. Pl. i. 419 (1797). *F. octoflora*, var. *tenella* (Willd.) Fernald in RHODORA, xxxiv. 209 (1932).

V. OCTOFLORA, var. **glauca** (Nutt.), comb. nov. *Festuca tenella*, β . *glauca* Nutt. in Trans. Am. Phil. Soc., ser. 2, v. 147 (1835). *F. octoflora*, var. *glauca* (Nutt.) Fernald, l. c. (1932).

It is difficult to understand why the genus *Vulpia* has not been generally taken up in America, except that Piper, in his *North American Species of Festuca*, Contrib. U. S. Nat. Herb. x. pt. 1 (1905), followed Hackel in treating it as *Festuca*, subg. *Vulpia* and Hitchcock and others have followed Piper. The two groups, true *Festuca* L. and *Vulpia* K. C. Gmelin, are very different in morphology and in geographic occurrence. *Festuca* is a genus of perennials, occurring in temperate regions of both northern and southern hemispheres and extending to the Arctic and to high-alpine habitats. The florets open regularly and the plumose stigmas emerge from the sides of the lemmas; the 3 free anthers are exerted and, as we know, are so distinctive as to offer clear and diagnostic specific characters. The grain is ellipsoid or ovoid. In most species of true *Festuca* the 2nd glume is merely pointed, though sometimes awned, and the acute to blunt lemmas may be awnless or awned.

Vulpia, on the other hand, is a group chiefly of annuals, with the lower glume often greatly reduced, the upper one frequently awned, and the slender lemmas long-attenuate to long-awned. The florets do not open, but remain closed (cleistogamous) and are enlarged upward when the anther is mature, the 1 (rarely 3) included anther being appressed to the lemma or to the included stigmas and with nearly suppressed filament; and the linear-cylindric grains are attenuate to each end. This characteristic group occurs in temperate Europe and the Mediterranean region (North Africa and southwestern Asia), in temperate (not frigid) North America and in western South America.

The fact that Hackel in his earlier work and in Engler & Prantl merged *Vulpia* with *Festuca* is hardly sufficient ground for maintaining an artificial union. Hackel, likewise, merged other groups which, in Washington, have been officially segregated.

Thus, by Hackel, in his monumental *Andropogoneae* in DC. Mon. vi. (1889), *Sorghum*, *Sorghastrum* (*Chrysopogon*), including *Rhaphis*, *Vetiveria*, *Cymbopogon*, *Hyparrhenia* and *Heteropogon*, all maintained with us as genera, were merged into *Andropogon*; and just imagine how the ultraconservative and very accurate Hackel would have groaned at the segregation of *Panicum* as he conceived it; to him *Digitaria*, *Trichachne*, *Brachiaria*, *Echinochloa*, etc., were mere sections of *Panicum*. Since all or nearly all of his sections in *Panicum* and his subgenera in *Andropogon* (as well as in many other groups) are taken up in America as full genera, why discriminate against his *Festuca*, subg. *Vulpia*? In Europe and Africa nearly all, if not quite all, recent close students of the *Gramineae* regularly maintain *Vulpia* as a genus: Beck von Managetta, Rouy, Hegi, Lindman, Henrard and such sound and conservative British authorities on grasses as Bews, C. E. Hubbard and Vaughan. It seems reactionary to persist in merging *Vulpia* with *Festuca*¹.

ERAGROSTIS MULTICAULIS Steud. Synop. Pl. Glum. i. 426 (1855). *Glyceria airoides* Steud. l. c. 287 (1854), not Reichenb. (1827). *E. pilosa*, var. *Damiensiana* Bonnet in Naturaliste, iii. 412 (1881). *E. pilosa*, var. *condensata* Hackel in Allg. Bot. Zeitschr. vii. 13 (1901). *E. peregrina* Wiegand in RHODORA, xix. 95 (1917). *E. Damiensiana* (Bonnet) Thell. in Fedde, Repert. xxiv. 323 (1928).

I am indebted to Capt. Stanley J. Smith for calling my attention to the correct name for the ruderal annual which has rapidly spread in eastern North America and which is currently known as *Eragrostis peregrina* Wiegand. In their *Grasses of Mauritius and Rodriguez*, 43 (1940) the two distinguished English specialists on grasses, C. E. Hubbard and R. E. Vaughan, give the above bibliography of *E. multicaulis*, "Native of eastern Asia; introduced into Europe, America and Australia". Steudel originally described the species as *Glyceria airoides* from Japan but a year later, describing it under *Eragrostis*, he rightly gave a new specific name, since his earlier name, *Glyceria airoides*, was a later homonym. Now that we know *E. multicaulis* (*E. peregrina*) to be introduced from eastern Asia, not indigenous, its behavior, suddenly appearing and then rapidly spreading, is easily understood. It well matches eastern Asiatic specimens.

¹ For a scholarly discussion see HENRARD, TH., *A Study in the Genus Vulpia*, Blumea, ii. 299-326 (1937).

PHLEUM PRATENSE L., var. *NODOSUM* (L.) Schreb. Local range extended inland to GREENSVILLE Co.: roadside bordering sandy woods and thickets along Fontaine Creek, near Round Hill Church, no. 14,556.

PANICUM AGROSTOIDES Spreng., var. *RAMOSIUS* (Mohr) Fernald. Local range extended inland to western GREENSVILLE Co.: bottomland woods along Fontaine Creek, at mouth of Quarrel's Creek, no. 14,688.

P. ROANOKENSE Ashe. Range extended inland from Coastal Plain to western GREENSVILLE Co.: low woods, Mitchell's Mill-pond, west of Brink, no. 14,563.

* *SETARIA FABERII* Herrm. See *RHODORA*, xlvi. 57, 58 (1944). Abundantly naturalized in ROANOKE and BOTETOURT Cos., *C. E. Wood, Jr.*

ERIANTHUS ALOPECUROIDES (L.) Ell. BRUNSWICK COUNTY: abundant in bottomland woods along Rattlesnake Creek, at old Clipper's Mill, southwest of Triplett, no. 14,690. Chiefly an inland species, here at our first station in the southeastern counties. See p. 100.

* *TRIPSACUM DACTYLOIDES* L., var. *OCCIDENTALE* Cutler & Anders. in *Ann. Mo. Bot. Gard.* xxviii. 258 (1941). BRUNSWICK COUNTY: border of low woods, Meherrin River at Westward Bridge (or Mill), no. 14,565. HALIFAX COUNTY: Lawson Creek, southwest of South Boston, June 21, 1938, *Fosberg*, no. 15,412. See p. 99.

Recently distinguished as a supposed endemic of the Davis and the Chisos Mts. of western Texas, on account of the long and narrow acuminate glumes of the staminate spikelets. The plant at Westward Bridge is closely associated with *Muhlenbergia glabriflora* Scribn., there at its first known station east of the Mississippi Basin (southwestern Indiana and Illinois to Texas)—see Fernald in *RHODORA*, xlv. 379 and 385 (1943). It is a very close match for the TYPE-collection of var. *occidentale* (*Moore & Steyermark*, no. 3092). Material from near Nashville, Tennessee, *Gattinger*, has even longer and narrower glumes and is comparable with coarse extremes of var. *occidentale* from Texas (Chisos Mts., *Mueller*, no. 7891 and *Warnock*, July 12, 1937, and Presidio Co., *L. C. Hinckley*, no. 1691).

THE IDENTITY OF *CYPERUS VIRENS* Michx. (PLATE 876, FIGS. 1-4).—In sorting the large accumulation of photographs of types assembled before the present war I have, rather naturally, been amazed to note that the type (FIG. 1, $\times \frac{1}{2}$) of *Cyperus virens* Michx. *Fl. Bor.-Am.* i. 28 (1803), "*Hab. in Carolina*", is very

characteristic material of *C. pseudovegetus* Steud., Syn. Cyp. 24 (1855) and not at all the plant which Steudel and all his followers have erroneously called *C. virens*. *C. virens* (FIGS. 1 and 3) is a relatively slender plant, with culms 3–7.5 dm. high; leaves nearly equaling the culm and 2–5 mm. wide, not strongly spongy below; the ovate spikelets (FIG. 4, $\times 5$) very flat and soon, by spreading of the narrow scales, with slightly excurved mucronate tips (FIG. 5), displaying the rachilla. The much coarser plant, erroneously passing as *C. virens*, has stout culms 0.5–1.2 (in the tropics –1.8) m. high; its spongy-based leaves much shorter than the culms (“Folia culmo parum breviora”—*Kükenthal*) and 5–13 mm. wide; the slightly narrower spikelets relatively plump, with the broader and straight scales (FIG. 5, $\times 5$) rather closely imbricated at base, so that the rachilla remains partly hidden. Differences in the achenes and other characters not evident in the photograph of Michaux’s type need not now concern us. The Michaux type (FIG. 1, $\times \frac{1}{2}$, and FIG. 2, $\times 10$) is very evidently the same as *C. pseudovegetus* (FIGS. 3 and 4) and not at all the coarser and largely tropical plant. If *Kükenthal*’s synonymy is safer to follow than his identifications of species (for *Kunth*’s types should certainly have been available to him, even if inhibition and Germanic self-satisfaction kept him from seeing Michaux’s in Paris), the coarser plant may perhaps be *C. robustus* *Kunth*, Enum. ii. 4 (1837). I have not yet checked that point, as it concerns a species as yet known only outside the area upon which I must chiefly concentrate. Michaux’s *C. virens* was from Carolina. Of the slender species which perfectly matches his type there are before me 12 sheets from North Carolina, 9 from South Carolina, 16 from Virginia and others from Delaware, Maryland, the District of Columbia and New Jersey. Of the coarse tropical and subtropical species the northernmost specimen (the only one I have seen from the state) is from Washington County, on Albemarle Sound, in North Carolina (so near the Virginia line that I may yet have to settle the name!), with 5 sheets from river-swamps and tidal reaches of South Carolina. Michaux got the ubiquitous species of the Carolinas.

CYPERUS (§ UMBELLATI) **Plukenetii**, sp. nov. (TAB. 877), rhizomate subligneo crasso abbreviato; culmo subrigido scabro-puberulo 0.3–1 m. alto; foliis firmis scabris planis 4–8 mm. latis

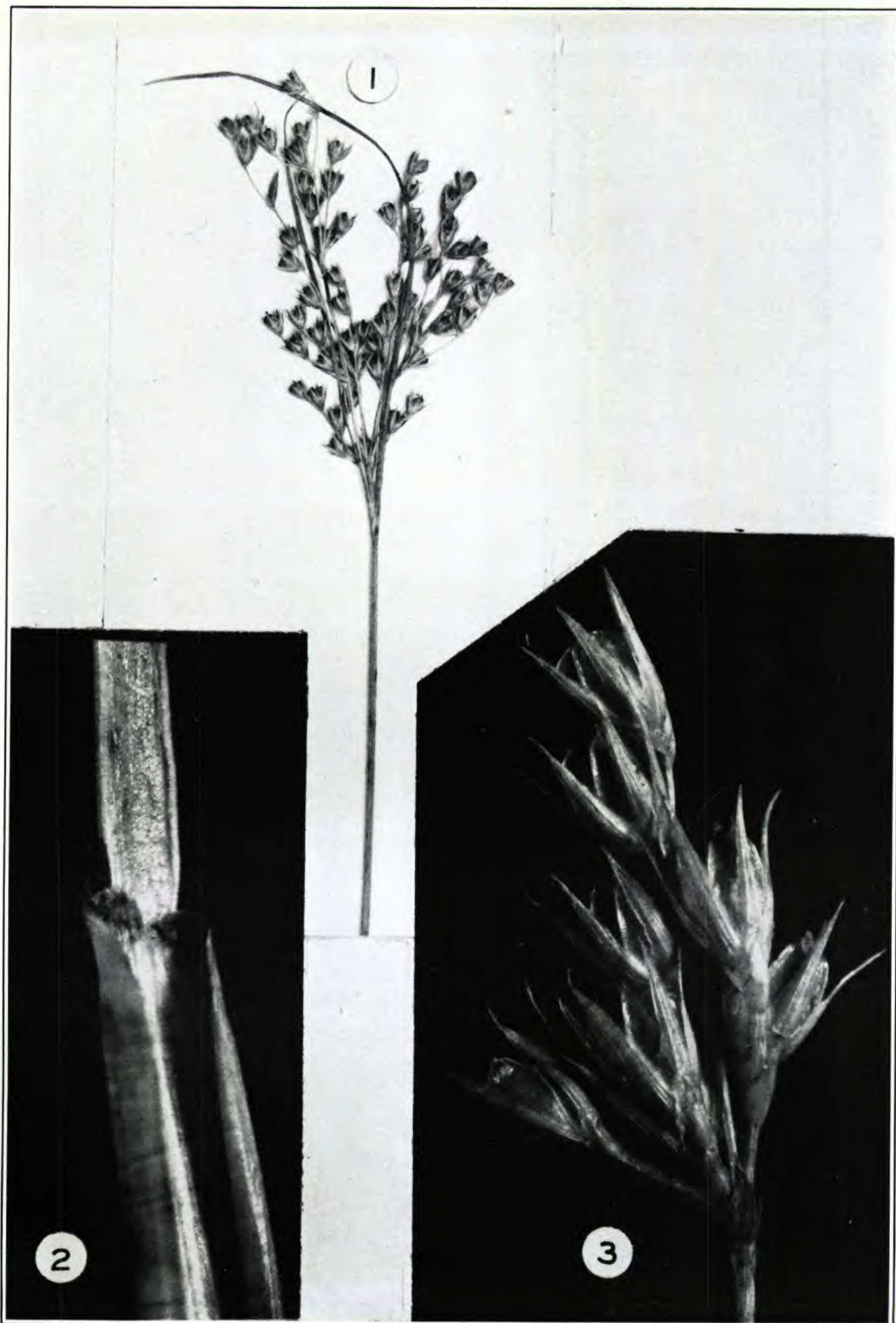


Photo. B. G. Schubert.

JUNCUS PLATYPHYLLUS: FIG. 1, inflorescence, $\times 1$; FIG. 2, summit of sheath and base of leaf, $\times 10$; FIG. 3, capsules, $\times 6$



Photo. B. G. Schubert.

JUNCUS CANADENSIS, var. EUROAUSTER: FIG. 1, portion of TYPE, $\times \frac{1}{2}$;
 FIG. 2, portion of glomerule, $\times 10$, from TYPE; FIG. 3, seeds, $\times 10$, from TYPE
 Var. SPARSIFLORUS: FIG. 4, inflorescence, $\times 1$; FIG. 5, glomerule, $\times 10$

attenuatis; involucre 3-7-phyllo, foliis quam radiis brevioribus scabris; radiis 4-12, subrigidis scabris adscendentibus ad 2.5 dm. longis; spicis turbinato-obovoideis 1-2.3 cm. longis; spiculis 75-125 lineari-subulatis valde appresso-reflexis 6-7 mm. longis; squamis 4 vel 5 striatis terminale involuta firma subacerosa; acheniis linearibus 2.5-3 mm. longis.—Dry or moist sands and rocks, Florida to Texas, north to New Jersey (possibly Long Island), southern Ohio and southeastern Missouri. TYPE: sandy pinelands, The Desert, Cape Henry, Virginia, July 28 and 29, 1934, *Fernald & Long*, no. 3734 (in Herb. Gray.; ISOTYPE in Herb. Phil. Acad.), distrib. as *C. retrofractus* (L.) Torr.

Cyperus Plukenetii, named for LEONARD PLUKENET (1641-1706), who originally described and illustrated it (our FIG. 1) from Virginia, has been erroneously passing as *C. retrofractus* (L.) Torr., Fl. N. Y. ii. 344 (1843), Torrey's combination resting on the *Scirpus retrofractus* L. Sp. Pl. 70 (1753), our PLATE 878. Linnaeus, like Torrey and some others after him, confused two quite distinct species. His original account was very brief:

retrofractus. 17. SCIRPUS culmo triquetro, umbella simplici: spicarum flosculis retrofractis.

Cyperus generis indianam, panicula speciosa, spiculis propendentibus atris. *Pluk. phyt.* 415. f. 4.

Habitat in Virginia.

As is so often the case, everyone since 1753 has taken the easier course. It was perfectly simple to turn to Plukenet and see his very characteristic figure (our FIG. 1); it would have required more effort and considerable trouble to find out what Linnaeus actually had before him. If they had taken this trouble, it would have been evident that the Linnean TYPE (PLATE 878, FIGS. 1 and 2) is not like the Plukenet plant, for Linnaeus had from Virginia a very characteristic specimen of *Cyperus hystri-cinus* Fernald in RHODORA, viii. 127 (1906), our PLATE 878, FIG. 3. In PLATE 878 I show the type (FIGS. 1 and 2) of *Scirpus retrofractus*, $\times \frac{1}{3}$ and $\frac{1}{2}$, from a photograph received from Mr. Savage. With it, $\times 1$, is an umbel from the type of *Cyperus hystri-cinus*¹. That they are quite the same no one, who really understands *Cyperus*, can doubt.

True *C. retrofractus* (*C. hystri-cinus*) differs in many characters from *C. Plukenetii* (*C. retrofractus* sensu Torrey, for the most

¹ This type, from Haddonfield, New Jersey, was collected by *C. F. Parker*, not *C. F. Austin*, as erroneously stated with the original description.

part, and most later authors, incl. Kükenthal in Engler, Pflanzenr. iv²⁰. fig. 56 (1935), the latter an excellent illustration of *C. Plukenetii*). The chief differences are as follows:

C. RETROFRACTUS: rhizome relatively slender and elongate, the corms (when more than 1) remote; culm smooth and glabrous; leaves smooth and glabrous, the basal 2–5 mm. wide; rays of umbel smooth, when fully mature mostly shorter than the smooth and narrow involucral leaves; spikes cylindric or cylindric-obovoid; spikelets golden brown, not pungent, soon loosely reflexed and promptly falling; achenes 2–2.5 mm. long.

C. PLUKENETHII: rhizome stoutish, the corms (when more than 1) approximate; culm scabrous-puberulent; leaves harsh and pubescent, the basal 4–8 mm. wide; rays of umbel scabrous, when mature mostly much longer than the involucral leaves; spikes strongly turbinate-obovoid, tapering to acute obconic base; spikelets greenish, becoming drab or dull brown, pungent, soon tightly appressed-reflexed, long-persistent; achenes 2.5–3 mm. long.

If one takes Kükenthal's bibliography at its face value it will be found as unreliable for North American plants as his treatment of many of our species. Besides *Scirpus retrofractus* L. and the resultant combinations under *Cyperus* and *Mariscus* he gives, without the slightest indication of doubt, the synonym *Mariscus pubescens* Presl, Reliq. Haenk. i. 181 (1830). Now, *Cyperus retrofractus* sensu Kükenthal (*C. Plukenetii*), with, to quote Kükenthal, involucral leaves (like the basal) "4–8 mm. lata plana", the "spicae obovato-turbinatae", "Spiculae omnes retroflexae", occurs from Florida to eastern Texas, north to New Jersey, southern Ohio and southeastern Missouri. *Mariscus pubescens* Presl was originally said to be from Monterey, California, its "Involucella setacea", the "Spicae cylindratae", "Spiculae horizontales". Kükenthal has another guess coming, if he survives the war. He evidently accepted, without looking up the Presl plant or description, the entry in Index Kewensis, fasc. iii. 169 (1894) under *Mariscus*: "*pubescens*, J. & C. Presl, Rel. Haenk. i. 181 = *retrofractus*". In the first fascicle, 697 (1893) the editor, Jackson, had entered the same plant as a maintained species of *Cyperus*: "*pubescens*, J. & C. Presl, Rel. Haenk. i. 181—Calif.", thus making a new and superfluous name, for there was already a *C. pubescens* Steud. (1855)¹.

PLATE 876, FIGS. 1–4, *CYPERUS VIRENS* Michx.: FIG. 1, TYPE, $\times \frac{1}{2}$, photograph after *Cintract*; FIG. 2, spikelets, $\times 10$, from TYPE; FIG. 3, inflorescences,

¹ *Mariscus pubescens* was named for the very pubescent culm and leaves. So far as I can find, nothing like it is known in California. It might have come from western Mexico, the Philippine Islands, Peru or some other Pacific area. Steudel, Syn. Pl. Cyp. 50 (1855) had a *Cyperus pubescens* from the Island of Bourbon.

× ½, of characteristic *C. pseudovegetus* Steud. from Accomac, Virginia, Fernald, Long & Fogg, no. 5225; FIG. 4, spikelet, × 5, from no. 5225. FIG. 5, *C. robustus* Kunth (*C. virens* sensu Steudel and later auth., not Michx.): spikelet, × 5, from Walterboro, Colleton Co., South Carolina, Wiegand & Manning, no. 523.

PLATE 877, *CYPERUS PLUKENETII* Fernald: FIG. 1, Plukenet's figure of *Cyperus* genus *indianam*, etc. from Virginia, included by Linnaeus under his mixed *Scirpus retrofractus*; FIG. 2, inflorescence, × 1, of TYPE; FIG. 3, characteristic base, × 1, from Cypress Bridge, Southampton Co., Virginia, Fernald & Long, no. 6040.

PLATE 878, *C. RETROFRACTUS* (L.) Torr. as to type: FIG. 1, TYPE, × ⅓, of *Scirpus retrofractus* L., courtesy of Mr. S. Savage; FIG. 2, inflorescence, × ½, of TYPE; FIG. 3, inflorescence, × 1, of type of *C. hystericinus* Fernald; FIG. 4, characteristic rhizome, × 1, from Joyner's Bridge, Isle of Wight Co., Virginia, Fernald, Griscom & Long, no. 6528.

C. ODORATUS L. Sp. Pl. i. 46 (1753). *C. ferax* Richard in Act. Soc. Hist. Nat. Par. i. 106 (1792).—Frequent in saline and brackish marshes or on shores along the coast.

Since some have questioned the identity of these two species, a memorandum by Dandy in Exell, Cat. Vasc. Pl. So. Tomé, 360 (1944), is important to quote. Under *C. odoratus* L. he says:

This species is the true *C. odoratus* of Linnaeus, which was based on the Jamaican plant named *Cyperus odoratus, panicula sparsa, spicis strigosioribus viridibus* by Sloane, Cat. Pl. Ins. Jam. 35 (1696); Voy. Jam. Nat. Hist. I. 116, t. 74, fig. I (1707). . . . The original specimen from which Sloane's figure was drawn is preserved in Herb. Sloane (vol. II. fol. 46) at the British Museum, and is identical with *C. ferax* Rich. There was no specimen of *C. odoratus* in the Linnean Herbarium in 1753, and the type of the species is Sloane's figure (since Linnaeus did not see the actual specimen). The name *C. odoratus* has been misapplied to *C. polystachyos* and other species.

C. TENUIFOLIUS (Steud.) Dandy in Exell, Cat. Vasc. Pl. So. Tomé, 363 (1944).—Seen along wet woodroads in the Seward Forest, but not collected; common farther east.

C. tenuifolius (Steud.) Dandy is the plant generally known as *Kyllinga pumila* Michx. (1803), the genus *Kyllinga* now very generally reduced to *Cyperus*. Its essential synonymy, as given by Dandy, is as follows:

C. TENUIFOLIUS (Steud.) Dandy, l. c. (1944). *Kyllinga pumila* Michx. (1803), not *C. pumilus* L. (1756). *K. elongata* Kunth (1816), not *C. elongatus* Steud. (1855). *K. caespitosa* Nees (1842), not *C. caespitosus* Poir (1806). *K. tenuifolia* Steud. (1855). *K. rigidula* Steud. in part (1855), not *C. rigidulus* Vahl (1806). *C. densicaespitosus* Mattf. & Kükenth. (1936).

* *FIMBRISTYLIS DRUMMONDII* Boeckl. BRUNSWICK COUNTY: damp openings in woods, "Moseley flat pineland", near Triplett, Fernald (with J. B. Lewis), no. 14,568. See p. 95.

Fimbristylis Drummondii has been variously confused with a number of other species, particularly with the tropical South American and very distinct *F. spadicea* (L.) Vahl and the halophilous North American *F. castanea* (Michx.) Vahl and *F. caroliniana* (Lam.) Fernald (= *F. puberula* (Michx.) Vahl). *F. castanea* is the coarse and densely cespitose, rigid plant of salt marshes and saline shores, from the West Indies and Florida to Texas, extending northward on saline marshes to Long Island. Its coriaceous dark sheaths, rigid culms up to 1 m. tall, its lustrous and coriaceous broadly rounded scales and the castaneous broad-ovoid achenes clearly mark it. *F. caroliniana* (Lam.) Fernald in RHODORA, xlii. 246 (1940) is the same as *F. puberula* (Michx.) Vahl and its habit was clearly shown in RHODORA xxxvii. t. 388 (1935). It is contrasted with *F. castanea* by its small soft-based tufts, with paler sheaths, its prolonged and slender cord-like scaly stolons, its thinner and membranaceous scales, at least the outer ones puberulent, and the narrower and paler achene. It occurs on brackish or saline sands, flats or marshes and in dune-hollows along the coast from Florida to Texas, northward to New Jersey.

Fimbristylis Drummondii, on the other hand, is nonstoloniferous; its culm-bases are enlarged and bulbous and when fully developed it makes dense tussocks with the stout rhizome forking into thick crowns covered with the bulbous-based tufts. Too many specimens in herbaria, however, merely pulled off from the rhizome, fail to display this distinctive character and very young and first-fruited plants often have only poorly developed rhizomes. They have, however, the bulbous bases which are characteristic, the puberulent scales and the pale achenes. This plant, which has recently been confused with the others, is a species of peats, sterile meadows, pine and oak barrens, and other acid habitats. It occurs from Florida to eastern Texas, northward to Virginia, southeastern Pennsylvania, the New Jersey pine barrens and the Hempstead Plains of Long Island; in the interior across Tennessee and Arkansas to southern Michigan, Illinois and Missouri. Whereas the halophilous *F. castanea* and *F. caroliniana* fruit from late July to October, the inland *F. Drummondii* is mature from May into July, the Virginia material, collected in June, being over-ripe. One other species of this

series should be noted, *F. interior* Britton in Britt. & Br. Ill. Fl. ed. 2, i. 320, fig. 785 (1913), a species of the Great Plains, from east-central Nebraska to eastern Colorado, south to Texas. Somewhat resembling both *F. caroliniana* and *F. Drummondii*, the material has bulbous-based tufts of the latter but shows no tendency to produce subligneous rhizomes and occasionally it develops stolons suggesting those of the former species. Its scales, however, are firmer and glabrous or glabrescent and its achenes with many more longitudinal ribs than in the others. It seems to be a well defined campestrian species.

The correct application of the name *Fimbristylis Drummondii* needs clarification, for its author, Boeckeler, created a confusion regarding it, the effects of which still linger. Boeckeler published his first *F. Drummondii* in Flora, xli. 603 (1858), a plant with "basi valde bulboso-incrassato, bulbo (crassitie nucis Coryli minoris) vaginis . . . coreaceis. . . . oblecto . . . squamis . . . omnibus puberulis", etc. This species consisted of two varieties: " α . *minor*; culmo subpedali, umbella subsimplici, spicis magis ovatis foliis superne scabris. Prope N. Orleans legit Drummond. (In hrb. ej. sub Nro. 416.)" and " β . *major*; culmis elatis (sesquipedalibus); spicis paulo majoribus subglobosis, involucellis squamisque glabrescentibus. Ad rio Brazas terrae Texanae legit Drummond". Since var. α . *minor* was the first defined and since two sheets of Drummond's no. 416 from New Orleans before me have the puberulent scales as described in Boeckeler's full description I am taking these to be isotypes of *F. Drummondii*. His var. β . *major* seems to contradict his fuller description in having "squamis glabrescentibus". Boeckeler cited no number and, presumably, his type is now destroyed. If it came from the upper Brazos it might have been *F. interior* Britton; if from the tidal reaches of the lower Brazos it might have been the glabrous-scaled *F. castanea* (Michx.) Vahl, which abounds in coastwise Texas. The latter species does not have bulbous bases, however; but Boeckeler's "squamis glabrescentibus" is not easily reconciled with his "squamis . . . omnibus puberulis" of his primary description of *F. Drummondii*. Although the identity of var. β . *major* can not now be settled, the identity of var. α . *minor* is clear. It is the plant I am taking up as *F. Drummondii*.

In 1836 Torrey, treating the all-inclusive *Isolepis*, placed together in one series two species, *I. capillaris*, the tiny capillary-leaved annual now known as *Bulbostylis capillaris*, and the new *I. Drummondii* Torr. & Hook. in Ann. Lyc. Nat. Hist. N. Y. iii. 350 (1836), this being a very tall plant, with firm “*Culm* 3 feet high . . . *Spikes* half an inch long . . . *Scales* closely appressed [coriaceous], smooth . . . HAB. Texas, *T. Drummond!*”, the authors stating that it has the habit of *Fimbristylis spadicea*. I have not seen the type but the description suggests *F. castanea*. Still another Drummond plant from Texas was described by Boeckeler, this his *F. anomala* in Flora, xliii. 242 (1860), “*Caespitosa*; radice valide fibrosa stolonifera; stolonibus tenuibus (crass. pennae corvinae) . . . culmo 1–2 pedali rigido . . . spicis 3–4 lin. longis $1\frac{1}{3}$ lin. latis . . . ; squamis arcte imbricatis . . . , inferioribus puberulis . . . Texas. Herb. Drummond. Nr. 445.” This number, likewise, I have not seen. The point in bringing into the discussion *Isolepis Drummondii*, with culms “3 feet high” and smooth scales, and *F. anomala*, 1–2 feet high, stoloniferous, with lower scales puberulent, is that they both soon figured under another name, *F. Drummondii* (Torr. & Hook.) Boeckeler in Linnaea, xxxvii. 21 (1871), based nomenclaturally upon *Isolepis Drummondii* Torr. & Hook., with *F. anomala* cited as a synonym, this plant stoloniferous, the subsolitary culms $1\frac{1}{2}$ – $2\frac{1}{2}$ feet high, the scales of the spikelet *membranaceous-margined*, “nitidulis”.

Naturally, there can be no second valid *Fimbristylis Drummondii* (Torr. & Hook.) Boeckl. (1871), in view of the earlier and different *F. Drummondii* Boeckl. (1858), which is the eastern species with bulbous-based tufts arising from stout caudices or hard rhizomes, with the outer scales of the spikelets puberulent. Whether *F. anomala* is an earlier name for *F. interior* I do not know; only examination of Boeckeler’s type or of an unquestioned isotype can settle that. But for our plant the name *F. Drummondii* Boeckl. (1858) seems to be the correct one.

SCIRPUS POLYPHYLLUS Vahl. To the very few stations in the southeastern counties add one in BRUNSWICK Co.: margin of Mill Creek, southwest of Ebony, no. 14,566.

S. DIVARICATUS Ell. Local range extended inland to western GREENSVILLE Co.: bottomland woods along Quarrel’s Creek below Pair’s Store, no. 14,567. See p. 101.

FUIRENA SQUARROSA Michx. (*F. hispida* Ell.). Local range extended into the Piedmont in BRUNSWICK Co.: springy sphagnous and argillaceous bog, Ram-hole Swamp, Seward Forest, near Triplett, no. 14,692; culms weak and reclining. See p. 103.

RHYNCHOSPORA CORNICULATA (Lam.) Gray. Range extended back into the Piedmont. GREENSVILLE Co.: bottomland woods along Fontaine Creek, at mouth of Quarrel's Creek, no. 14,694. BRUNSWICK Co.: bottomland woods along Rattlesnake Creek, at old Clipper's Mill, southeast of Triplett, no. 14,693. See p. 100.

R. GLOBULARIS (Chapm.) Small, var. **RECOGNITA** Gale (*R. cymosa* sensu Torr. and later auth., not Ell.). Local range extended from Coastal Plain inland to BRUNSWICK Co.: springy sphagnous and argillaceous bog, Ram-hole Swamp, Seward Forest, near Triplett, no. 14,569; damp openings in woods, Moseley flat pineland, near Triplett, nos. 14,570 and 14,571. See p. 103.

SCLERIA PAUCIFLORA Muhl. To the counties from which this species is known (see RHODORA, xxxix. 392) add GREENSVILLE Co.: swaley clearing along Quarrel's Creek, below Pair's Store, no. 14,573. Also BRUNSWICK Co.: damp woods along branch, east of Moseley flat pineland, near Triplett, no. 14,574. See p. 96.

CAREX HIRSUTELLA Mackenzie. BRUNSWICK COUNTY: woods, Moseley flat pineland, near Triplett, no. 14,581, our first station in the southeastern counties. Plant very lax, with flaccid, loosely divergent culms, the inflorescences lopping to the ground. See p. 96.

COMMELINA VIRGINICA L. (*C. hirtella* Vahl). Ordinarily with erect flowering stems, the plants in bottomland woods along Meherrin River at Westward Bridge (or Mill) have them depressed or trailing (no. 14,695).

Since the summer had been one of unusual drouth and the *Commelina* was well above the level of the river in mid-September the trailing habit was, obviously, not induced, at least during this season, by drowning.

THE IDENTITY OF **JUNCUS TENUIS** (PLATE 879).—*Juncus tenuis* was described by Willdenow, Sp. Pl. ii¹. 214 (1800)¹, as follows:

*23. **JUNCUS tenuis** W.

J. culmo teretiusculo indiviso, foliis linearibus canaliculatis, corymbo terminali, calycinis foliolis acuminatis capsula triquetra obtusa longioribus. W.

Schlanke Simse. W.

¹ Although the title-page gives the date 1799, vol. ii. pt. 1, was apparently not issued until early in 1800.—See Schubert in RHODORA, xlv. 147-150 (1942).

*Habitat in America boreali.*¹ 2 (v. s.)

Culmus dodrantalis teretiuseculus subcompressus basi foliosus. Folia ut in praecedente. Flores ut in praecedente [i. e. *J. bulbosus* sensu Willd. incl. *J. compressus* Jacq. and *J. Gerardi* Loisel.] *sed duplo majores et rami laterales corymbi majis elongati.*

Foliola calycina lanceolata acuminata capsula paulo longiora. Capsula triquetra truncato-obtusa. W.

Practically without exception the name *Juncus tenuis* was thereafter correctly applied to a widespread and very common species with drab or pale brown young sheaths, flattish (though on drying often inrolled) leaves with whitish scarious and friable margins to the sheaths, the elongate-oblong or lanceolate auricles thin and scarious or thin-hyaline, the inflorescence greatly overtopped by 2 or more flattish bracts, the flowers, in more open inflorescences, inclined to be grouped in 3's, the perianth overtopping the oblong-ovoid capsule which is retuse at summit and partially 3-locular. So firmly established was the name *J. tenuis* Willd. for this clear-cut and wide-ranging species (much of North America, Europe, Australia, New Zealand, etc.) that it came as a shock when, in 1929, the late Kenneth K. Mackenzie announced:

"*Juncus tenuis* Willd. (Sp. Pl. 2: 214. 1799), 'Habitat in America boreali,' is *Juncus dichotomus* Elliott (Bot. S. Carolina & Georgia 1: 406. 1817), and is not the plant appearing as *Juncus tenuis* in our current manuals. Dr. Diels, Director of the Botanical Garden and Museum at Berlin, has very kindly sent me from Willdenow's material portions showing the leaf-blade, the mouth of the sheath, the inflorescence, and the seeds. The leaf-blade is not flattened, and the auricles are rounded cartilaginous and not conspicuously prolonged.

"I was brought to look into this matter by noting that Steudel (Syn. Pl. Glum. 2: 305. 1855) described *Juncus tenuis* Willd. as with 'vaginis adpressis ore nudis'. On the same page he described a new species *Juncus germanorum* ('*J. tenuis* Auctor. Germ.') as with 'vaginis laxiusculis ore in marginem membranaceum utrinque productis (ligulam mentientem)'. This last, of course, is a very accurate description of the plant appearing in our manuals as *Juncus tenuis*'—Mackenzie in Bull. Torr. Bot. Cl. lvi. 25 (1929).

That seemed to settle the matter and I promptly fell into the unintentional trap. In my search for the earliest name for *Juncus tenuis* of most authors I found, while in England, that the earliest available name (if *J. tenuis* Willd. is indeed only *J.*

¹ The "*Habitat in America boreali*" of Willdenow is rendered by Index Kewensis as "Europ.; Ind. occ.; Austral."

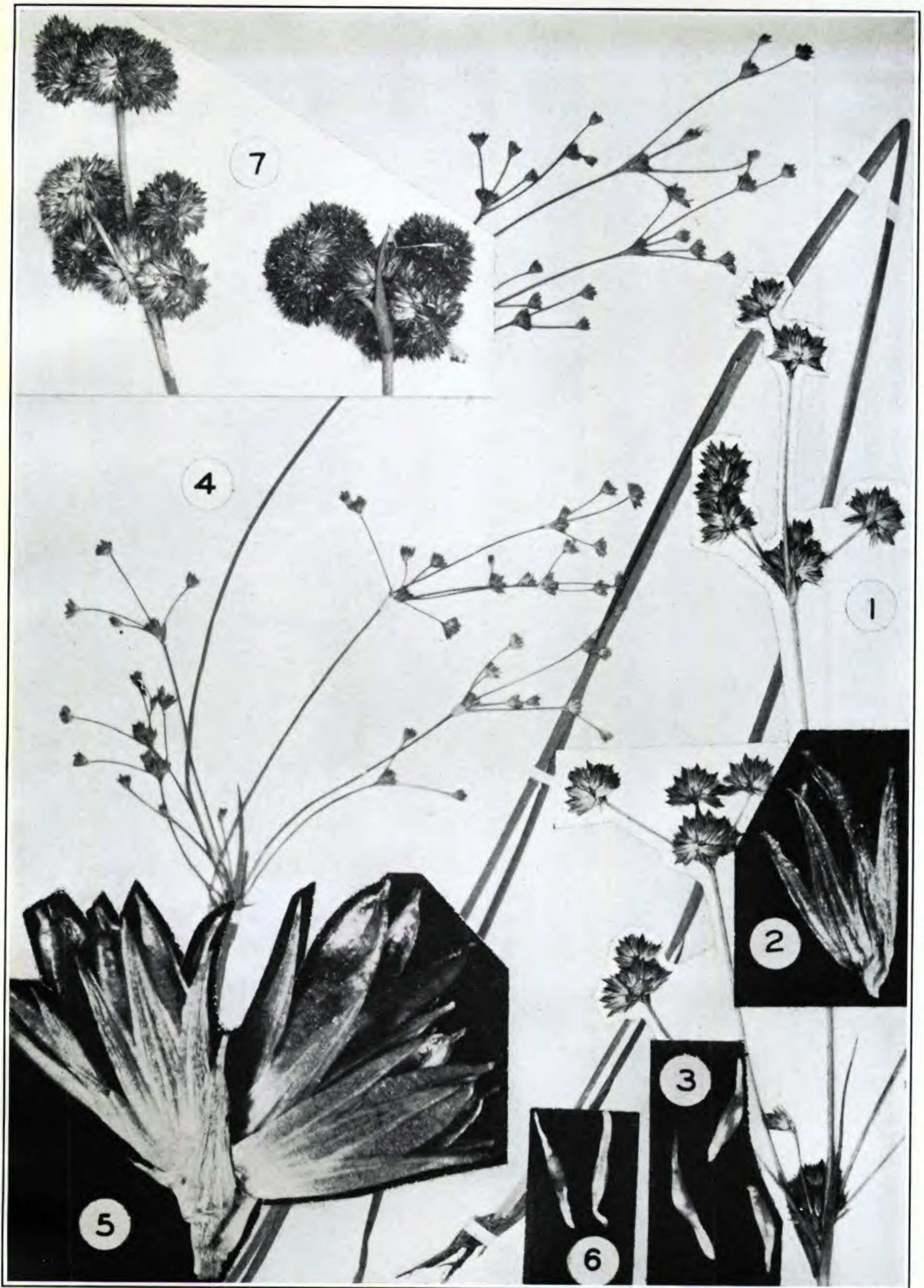


Photo. B. G. Schubert.

JUNCUS CANADENSIS, var. TYPICUS: FIG. 1, inflorescence, $\times 1$; FIG. 2, flower, $\times 10$; FIG. 3, seeds, $\times 10$
 Forma APERTUS, all figs. from TYPE: FIG. 4, inflorescence, $\times \frac{1}{2}$; FIG. 5, glomerule, $\times 10$; FIG. 6, seeds, $\times 10$
 Forma CONGLOBATUS: FIG. 7, two inflorescences, $\times 1$, from TYPE



RUMEX BRITANNICA: the Clayton (Gronovian) specimen from Virginia, photo. from Dr. John Ramsbottom = R. OBTUSIFOLIUS L.

dichotomus Ell.) seemed to be *J. macer* S. F. Gray, Nat. Arr. Brit. Pl. ii. 104 (1821). This decision I announced in Journ. Bot. lxxviii. 366 (1930) and, most unfortunately, my interpretation has been generally accepted in America, Europe and Australia.

The difficulty seems to be, that Willdenow had mixed material. From Mackenzie's account the fragments sent to him were apparently from *J. dichotomus* Ell. That species (FIGS. 5-7), however, is strongly distinguished from *J. macer* (*J. tenuis* of Rostkovius, Engelmann, Buchenau, Gray, Britton, etc.), FIGS. 1-4, by many characters:

J. MACER: (1) Tufts or tussocks relatively soft; young membranaceous sheaths drab or pale brown to greenish; (2) with whitish friable broad scarious margins; (3) the uninjured auricles lance-triangular to -oblong, scarious or thin-hyaline and much longer than broad; (4) leaf-blades flat or broadly canaliculate; (5) lower involucral bract and ordinarily 1 or 2 others much prolonged beyond the cyme; (6) cyme either compact or open and with elongate outer branches, each branch or branchlet (in the typical form) with 2-6 (commonly 3) approximate flowers; (7) prophylla thin or membranaceous, greenish or drab; (8) sepals much longer than capsule; (9) capsule retuse, 3-locular; (10) anthers much shorter than filaments; etc.

J. DICHOTOMUS Ell.: (1) Dense and hard tussocks with inner firm sheaths purple-tinged, the outer brown, (2) without friable margins; (3) short rounded auricles firm and cartilaginous; (4) leaf-blades filiform, merely slenderly channeled on upper side; (5) lower involucral bract shorter than or but slightly exceeding cyme, the others shorter; (6) cyme with flowers mostly secund and alternate along the branchlets; (7) prophylla coriaceous, pale to deeper-brown; (8) sepals and capsule subequal; (9) capsule rounded at summit, 1-locular; (10) anthers nearly equaling filaments.

Willdenow's original description, of course, has final significance. This was beautifully supplemented by the dissertation on *Juncus* by Rostkovius—De Iunco (1801)—for Rostkovius definitely states that his dissertation for the degree of Doctor of Medicine¹ was based upon the material of *Juncus* in Willdenow's Herbarium: "Cum absoluto cursu academico de specimine inaugurali meditarer, inter varia argumenta suasu optimi Praeceptoris Clarissimi W I L L D E N O W I I, Professoris Historiae naturalis Berolini, e ditissimo Suo Herbario Iunci genus selegi, quod benevolentia Celeberrimorum Virorum L I N K I I, M Ü H L-

¹ How our M. D's. have slumped! One of them in Cambridge came to see me and asked: "Are there any plants around here which might poison a child? I was called up to see a sick child and I can't make out what is the trouble". "There's one right there", I replied, pointing to *Datura Stramonium*. "All right", he said, "I'll treat him for Stramonium-poisoning". Another, also a professor in a distinguished medical school, argued at me throughout the length of a dinner, that there must be some simple formula (like the silver spoon with toadstools) by which any one can tell whether any wild plant is poisonous or edible!

ENBERGII, STEPHANII, et HOPPII valde auctum evasit, spe fretus hocce tentamen Botanophilis haud ingratum fore".—Rostk. Iunc. Praefatio (1801). Not only did Rostkovius (his p. 24) evidently study the plant which Willdenow had described as *J. tenuis*; he gave a very detailed description of it and an illustration of the characteristic and wholly distinctive inflorescence (our PLATE 879, FIG. 1). Here is the account by Rostkovius:

18. *Iuncus tenuis*. Tab. Nost. I. fig. 3.

- I. culmo folioso simplici teretiusculo, foliis canaliculatis, corymbo terminali dichotomo foliis floralibus brevioribus, capsula oblongo obtusa petalis brevioribus.
- I. culmo teretiusculo indiviso, foliis linearibus canaliculatis, corymbo terminali, calycinis foliolis acuminatis capsula triquetra obtusa longioribus. *Sp. pl. ed. W. 2. p. 214.*
- I. foliolus minimus campestris et nemorensis *Gron. virg. 152.*
Gramen iunceum virginianum calyculis paleaceis bicorne *Moris. hist. 3. p. 228. f. 8. t. 9. f. 15.*
- Gramen iunceum elatius pericarpiis ovatis americanum *Pluk. alm. 179. t. 92. f. 9.*
Habitat in America boreali. 2.
Culmus semipedalis vel pedalis erectus simplex teretiusculus basi foliosus.
Folia linearia canaliculata.
Corymbus terminalis dichotomus, ramis multifloris.
Folia floralia bina, sub corymbo, linearia canaliculata, quorum alterum corymbo quadruplo longius, alterum longitudine corymbi vel paulo longius.
Calyx bivalvis membranaceus, valvulis lanceolatis acutis.
Corolla hexapetala, petalis lanceolatis acuminatis margine membranaceis, interioribus parum brevioribus.
Capsula oblonga triquetra obtusa basi styli persistentis coronata, trilocularis trivalvis polysperma, petalis brevior.
Similis praecedenti [*J. bulbosus* sensu Willd., i. e. *J. compressus* and *J. Gerardi*], sed corymbo dichotomo paucifloro, petalis acuminatis capsula longioribus diversus. Flores fere ut in Iunco bufonio. Synonyma Iunci nodosi a LINNAEO adducta huc per.

Now if we make an analysis of the differential characters of *Juncus tenuis*, as originally described by Willdenow, almost immediately thereafter and in great detail by Rostkovius from Willdenow's material, and by Engelmann, Buchenau, Wiegand and others who have maintained it in the sense of *J. macer*, (our FIGS. 1-4) and those of *J. tenuis* sensu Steudel and Mac-

kenzie and those of us who have supposed that they were right (i. e. *J. dichotomus* Ell.), our FIGS. 5-7, we get the following results. The index-numbers are those used in the contrasts given on p. 119.

| | J. TENUIS as defined by Willdenow and by Rostkovius from Willdenow's material | J. DICHOTOMUS Elliott (<i>J. tenuis</i> sensu Steudel and Mackenzie) |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) Habit | No statement (Willd.) | "very small tufts" (Ell.) |
| (2) basal sheaths | No statement (Willd.) | No statement (Ell.) |
| (3) auricles | No statement (Willd.) | No statement (Ell.) |
| (4) basal leaves | linear, channeled (Willd., Rostk.); "readily distinguished . . . by its flat leaves, . . . only . . . on the margin slightly involute" (Engelm.); "lax, flat and soft, rarely slightly involute" (Wieg.); "folia . . . plana" (Buch.) | nearly terete, channeled on the upper side (Ell.); "terete . . . , marked by a shallow groove on their upper side" (Engelm.); "nearly terete, rarely much channeled" (Wieg.); "subteres, anguste canaliculata" (Buch.) |
| culms | nine inches high (Willd.); 1/2-1 ft. (Rostk.); a few inches to 2 ft. (Engelm.); 2-6 dm., commonly spreading (Wieg.); 10-40 (rarely -90) cm. (Buch.) | 1-2 ft. (Ell.); 3-10 dm., stiff, erect (Wieg.); 20-80 cm., strict (Buch.) |
| (5) lower involueral bracts | 2, linear-canaliculate, 4 times as long as corymb (Rostk.); 2, rarely 3, foliaceous, much exceeding inflorescence (Wieg.); 2 (rarely 1 or 3), frondose, "inflorescentia . . . longe superata" (Buch.) | "One . . . sometimes longer than the panicle, the others much shorter" (Ell.); "either longer or shorter" (Wieg.); "bractea infima frondosa inflorescentia nunc longior, nunc brevior" (Buch.) |
| (6) cyme | lateral branches much elongate (Willd.); "ramis multifloris" (Rostk.); fig. of Rostk. with flowers in 3's at tips of branches; flowers somewhat aggregated at ends of very unequal branches (Wieg.); open, mostly many-flowered, anthelate (Buch.) | dichotomus, flowers alternate and terminal (Ell.); anthelate, dense, rarely open (Buch.) |
| (7) prophylla | membranaceous (Rostk.) | coriaceous |
| (8) comparative length of sepals and capsule | longer than capsule (Willd.); "Capsula, . . . petalis brevior" (Rostk.); exceeding capsule (Engelm.); "capsule . . . shorter than the perianth" (Wieg.); "Fructus tepalis brevior" (Buch.) | "Capsule . . . , when mature, as long as the calyx" (Ell.); "capsule 3/4-7/8 the length of the perianth" (Wieg.); "Fructus perigonium fere aequantia" (Buch.) |

J. TENUIS as defined by
Willdenow and by Rostkovius
from Willdenow's material

J. DICHOTOMUS Elliott
(*J. tenuis* sensu Steudel
and Mackenzie)

(9) capsule

"Capsula *triquetra* truncato-
obtusa" (Willd.); "*Capsula*
oblonga triquetra obtusa . . .,
trilocularis" (Rostk.); retuse
(Engelm.); "thin-walled, ob-
tuse", "3-celled" (Wieg.)

"oval, nearly globose" (Ell.);
"subglobose, . . . but never
retuse . . . the ripe pods as-
sume a mahogany color"
(Engelm.); "ovate-oblong,
rounded", "1-celled" (Wieg.);
trigonous-spherical or -ovate,
obtuse (Buch.)

From this summary of the characters recognized by the original authors and by the closest students of the group in the past (with length of stamens and some other characters not mentioned by Willdenow or Rostkovius omitted) it should be apparent that the plant which Willdenow and, after him, Rostkovius, re-describing the Willdenovian material, had before them was of the species which Kunth, E. Meyer, Engelmann, Gray, Wiegand, Britton, Buchenau and most others have regularly and correctly recognized as *J. tenuis*, the plant which, most unfortunately, I took up in 1930 as *J. macer* S. F. Gray. The plant called *J. tenuis* by Steudel in 1855 and by Mackenzie in 1929 was obviously not what Willdenow diagnosed and Rostkovius more fully described and illustrated. Whether it was contemporaneous in the Willdenow Herbarium with the material actually described by him we may never know. At any rate, we cannot accept it as the type of his very different species; it is obviously material of *J. dichotomus* Ell.

Confusions in the old and much handled herbaria are common and no specimen in them should be accepted as the type of the briefly described old species unless it agrees with the description. That seems axiomatic, but too many students overlook the necessity to eliminate the demonstrably extraneous or subsequently acquired specimens. In case of the Willdenow Herbarium, now tragically lost, to the incalculable detriment of our science, such confusions have been demonstrated. Thus, as pointed out by Weatherby in *Contrib. Gray Herb.* no. cxxiv. 19 (1939), various students were misled by a confusion regarding the type of *Acrostichum lanuginosum* Willd. Quite similarly in *RHODORA*, xxxv. 193-195 (1933), I showed that students had been taking the wrong plant as the type of *Elymus striatus*

Willd. *Juncus tenuis* seems to be another case in which early confusion of material crept in. At any rate, we may now, happily, come out of the misinterpretation which has recently prevailed and again use the name *Juncus tenuis* as Willdenow described it and as most botanists up to Mackenzie have correctly interpreted it. With this reinstatement of long-established and erroneously abandoned temporary usage the following combination becomes necessary:

***JUNCUS TENUIS** Willd., forma **discretiflorus** (F. J. Hermann), comb. nov. *J. macer*, forma *discretiflorus* F. J. Hermann in RHODORA, xl. 82 (1938).

Although Hermann had seen forma *discretiflorus* only from the southern third of Indiana, it is of wider range, south at least into Tennessee and eastward to New York, Pennsylvania and Virginia. The following Virginian material is much larger than Hermann's largest specimen ("ultimate branches of inflorescence . . . frequently 7 cm. long"), for its longer branches have a length of 15 cm.:

SUSSEX COUNTY: wooded bottomland, Jones Hole Swamp, west of Coddysore, *Fernald & Long*, no. 10,187.

Although, as noted by me in Journ. Bot. lxxviii. 365 (1930), the Michaux material of his *Juncus bicornis*, Fl. Bor.-Am. i. 191 (1803) "is without question . . . *J. dichotomus*", the earlier and often misinterpreted name of Michaux cannot be taken up to replace Elliott's later one. After his not too convincing diagnosis of *J. bicornis* Michaux confused matters by giving as an exact synonym "*J. tenuis*. Rostk. 24. t. l. f. 3", the *J. tenuis* of Rostkovius being identical with and based upon *J. tenuis* Willd. (1800). By the present International Rules the name *J. bicornis* is, therefore, illegitimate, for Michaux was giving a new name and not taking up the valid earlier one as he should have done.¹ *J. dichotomus* Ell., therefore stands but

¹ Unfortunately the application of this rule to Michaux's Flora Boreali-Americana (1803) results in the following mishaps. For the first combinations I offer the superfluous apology that, my name as author of plant-names being abbreviated "Fern.", I occasionally feel justified in touching up the nomenclature of that group!

PTERETIS pensylvanica (Willd.), comb. nov. *Onoclea nodulosa* Michx. Fl. Bor.-Am. ii. 272 (1803), as to description and type-specimen preserved in Michx. Herb., not as to synonyms and habitat stated; Sw. Synop. Fil. 111 (1806); Schkuhr, Krypt. Gew. i. 96, t. 104 (1809). *Struthopteris pensylvanica* Willd. Sp. Pl. v. 289 (1810). *S. nodulosa* (Michx.) Desv. Mém. Soc. Linn. Paris, vi². 287 (1827). *S. germanica*, var. *pensylvanica* (Willd.) Lowe, Ferns, Brit. and Exot. ii. 138 (1862). *Matteuccia nodu-*

another plant which has been associated with it seems to be specifically distinct from it. It is discussed in the following notes.

JUNCUS platyphyllus (Wiegand), stat. nov. PLATE 880. *J. dichotomus* Ell., var. *platyphyllus* Wiegand in Bull. Torr. Bot. Cl. xxx. 448 (1903). *J. tenuis* Willd., var. *platyphyllus* (Wiegand) Cory in RHODORA, xxxviii. 405 (1936). See p. 96.

losa (Michx.) Fernald in RHODORA, xvii. 164 (1915). *Pteretis nodulosa* (Michx.) Nieuwl. in Am. Mid. Nat. iv. 334 (1916). *P. Struthiopteris*, var. *pensylvanica* [as *pennsylvanica*] (Willd.) Farwell in Rep. Mich. Acad. Sci. xxi. 346 (1920). *S. Struthiopteris*, var. *pensylvanica* (Willd.) Farw. in Am. Mid. Nat. xii. 252 (1931).

P. PENSYLVANICA, forma **pubescens** (Terry), comb. nov. *Struthiopteris germanica*, f. *pubescens* Terry in Clute in Fern Bull. xvi. 5 and 47 (1908), originally published by Clute as "Ostrich Fern var. *pubescens*". *Onoclea Struthiopteris*, var. *pubescens* (Terry) Clute, l. c. (1908). *S. pubescens* (Terry) Clute in Fern Bull. xvi. 48 (1908). *S. pensylvanica*, f. *pubescens* (Terry) Clute, l. c. (1908). *Matteuccia pubescens* (Terry) Clute, l. c. (1908). *M. Struthiopteris*, f. *pubescens* and var. *pubescens* (Terry) Clute, l. c. (1908). *Pteretis nodulosa*, f. *pubescens* (Terry) Fernald in RHODORA, xxxvii. 219 (1935). *P. Struthiopteris*, var. *pensylvanica*, subvar. *pubescens* (Terry) Clute in Am. Fern. Journ. xxxvii. 15 (1937).

P. PENSYLVANICA, forma **obtusilobata** (Clute), comb. nov. *Onoclea Struthiopteris*, f. *obtusilobata* Clute in Fern. Bull. xviii. 111 (1910). *Struthiopteris germanica*, f. *obtusilobata* Clute, l. c. (1910). *P. nodulosa*, f. *obtusilobata* (Clute) Fernald in RHODORA, xxxvii. 219 (1935). *P. Struthiopteris*, var. *pensylvanica*, subvar. *obtusilobata* (Clute) Farwell in Am. Fern Journ. xxvii. 15 (1937).

P. PENSYLVANICA, forma **foliacea** (Farw.), comb. nov. *P. Struthiopteris*, var. *pensylvanica*, subvar. *foliacea* Farwell in Am. Fern Journ. xxvii. 15 (1937). *P. nodulosa*, f. *foliacea* (Farw.) Broun, Index N. Am. Ferns, 150 (1938).

Unfortunately the combination *Pteretis nodulosa* is based upon an illegitimate name. When he published his *Onoclea nodulosa* Michaux gave what he thought two earlier synonyms for it. Although these do not apply to the plant he described, he nevertheless thought that they did. He should, therefore, have taken up the earlier specific name of the two. Both Swartz (1806) and Schkuhr (1809) repeated the supposed synonyms. Willdenow (1810) described his *Struthiopteris pensylvanica* from Muhlenberg material and gave no earlier name for it. His name is the first legitimate one for our plant.

SCIRPUS rubricosus, nom. nov. *S. Eriophorum* Michx. Fl. Bor.-Am. i. 33 (1803), as to plant described "spiculis copiosissimis, rufidulis, ovatis, omnibus distincte pedicellatis" and the "Hab. a Virginia ad Georgiam," not as to synonym, *Eriophorum cyperinum* L., cited.

Michaux well described the tall southeastern species (Florida to Tex., north to southeastern Massachusetts, Long Island, New Jersey, southeastern Pennsylvania, Maryland, West Virginia, Indiana and Illinois) with spikelets drooping on long pedicels and with bractlets, scales, etc., red-ochre in color (whence the new name); and his southern material, preserved at Paris, is unequivocal. He complicated matters, however, by giving the synonym *Eriophorum cyperinum* L. If, as he thought, his species was the Linnean one he should have used the latter's specific name. *S. cyperinus* (L.) Kunth, however, is a relatively northern species with the spikelets sessile in glomerules (Newfoundland to Minnesota, south to upland North Carolina and to Oklahoma). When Willdenow described the inclusive *S. thyrsiflorus* Willd. Enum. Hort. Berol. 78 (1809) he cited as mere synonyms *S. Eriophorum* Michx. and *Eriophorum cyperinum* L. Here again he neglected to take up the earliest specific name and by the International Rules of 1935 his *S. thyrsiflorus* is illegitimate.

S. RUBRICOSUS, forma **praelongus** (Fernald), comb. nov. *S. Eriophorum*, f. *praelongus* Fernald in RHODORA, xlv. 383 (1942).

Although Wiegand distinguished his var. *platyphyllus* from *J. dichotomus* merely by its "Leaves expanded and flat, otherwise as in the type", he and those who have seen only that character (less evident in dry foliage), overlooked several important points. *J. dichotomus* is a stiffly erect or ascending plant of the outer coastal strip, forming hard tussocks, with the inner firm sheaths purple-tinged, the outer ones brown. Its leaf-blades are stiff, filiform, or merely very slenderly channeled on the upper side, with short rounded firm and cartilaginous basal auricles (PLATE 879, FIG. 4). The lustrous hard perianth equals or but slightly exceeds the strongly lustrous brown obscurely 1-locular capsule (PLATE 879, FIG. 6).

In *J. platyphyllus* (a hardly descriptive name), on the other hand, the small tufts are relatively soft, although the fresh inner sheaths are purple-tinged; the blades are flat (FIG. 2) or, on drying, merely inrolled; the auricles (FIG. 2) are truncate or merely round-tipped, of firm-membranaceous texture and drab or fuscous, about as broad as long (these differing from the whitish scarious and friable lance-triangular or -oblong auricle of the green- to drab-sheathed *J. tenuis* Willd.); and the relatively soft perianth (FIG. 3) exceeds the paler-brown partially 3-locular capsule, in which the partitions extend half-way to the axis. Other characters in the bracteoles, seeds, etc. are good, but less obvious. Whereas *J. dichotomus* is strictly a coastwise species, *J. platyphyllus* extends far inland (to central Maine, western New York, the Piedmont of Pennsylvania, etc.). In Virginia it is common on the inner Coastal Plain and at least the outer Piedmont: to westernmost Brunswick Co., near the Mecklenberg line, 120 miles due west of False Cape, on the coast, where *J. dichotomus* prevails.

The collections (many more could have been made) of *Juncus platyphyllus* are the following from BRUNSWICK Co.: springy sphagnous and argillaceous bog, Ram-hole Swamp, Seward Forest, near Triplett, no. 14,585; damp thicket northeast of Ebony, no. 14,583.

PLATE 879, FIGS. 1-4, *JUNCUS TENUIS* Willd. (*J. macer* S. F. Gray): FIG. 1, inflorescence, $\times 1$, of TYPE, after *Rostkovius*; FIG. 2, characteristic inflorescence, $\times 1$, from Middletown, Rhode Island, July 4, 1909, *E. F. Williams*; FIG. 3, summit of sheath, showing friable hyaline margin and thin, prolonged and easily shriveled auricle, $\times 5$, from Southington, Connecticut, *L. Andrews*, no. 189; FIG. 4, mature fruits, $\times 6$, from Knight's Island, North Hero, Ver-

mont, July 14, 1901, *Ezra Brainerd*. FIGS. 5-7, *J. DICHOTOMUS* Ell. (*J. tenuis* sensu Steudel, Mackenzie and their followers, not Willd.): FIG. 5, summit of sheath and base of leaf, $\times 10$, from Angier, Hartnett Co., South Carolina, *Godfrey*, no. 4266; FIG. 6, inflorescence, $\times 1$, from no. 4266; FIG. 7, fruit, $\times 6$, from no. 4266.

PLATE 880, *J. PLATYPHYLLUS* (Wiegand) Fernald: FIG. 1, inflorescence, $\times 1$, from near Burgess Station, Dinwiddie Co., Virginia, *Fernald & Long*, no. 10,185; FIG. 2, summit of sheath and base of leaf, $\times 10$, from no. 10,185; FIG. 3, capsules, $\times 6$, from no. 10,185.

A SECOND STATION FOR *JUNCUS GRISCOMI*.—Two species of *Juncus* § *Genuini* are among the rarest plants of the eastern United States. The famous *J. gymnocarpus* Coville has a few remote stations, the northernmost in a sphagnous swamp on top of Broad Mountain in Schuylkill Co., Pennsylvania, where it was discovered by the late *Charles E. Smith*, the species appropriately called *J. Smithii* Engelm., but, on account of the earlier use of that name, changed to *J. gymnocarpus*. The other is *J. Griscomi* Fernald in RHODORA, xxxviii. 401, pl. 445, figs. 1-4 (1936), suggesting a lax-flowered extreme of *J. effusus* L., but with the flowers mostly on filiform pedicels up to 1 cm. long, the capsules rounded to the summit and definitely beaked (instead of emarginate and beakless). This remarkable plant was discovered by Griscom and me by lucky chance. Botanizing on a terrifically hot June day in 1935, on Little Neck in Princess Anne County, Virginia, we were panting with thirst when we saw children emerge from the rich woods with pails of water. Quick to take the hint, we followed the foot-path and came to a spring-rill and mossy swale in the deciduous woods, the swale solidly occupied by the strange new *Juncus*. Search by my companions and me during eight seasons has failed to reveal another station for it.

At the meeting of the New England Botanical Club on the evening of June 2nd last, I showed these two famously rare species and urged the members to watch for them in New England or elsewhere. I little expected immediate results; but promptly on the morning of June 3, looking through the miscellaneous unidentified *Junci* at the Gray Herbarium, I was surprised and delighted to find a beautifully characteristic specimen of *J. Griscomi*, sent in unidentified and collected on June 20, 1922, by *L. F. & Fannie R. Randolph* (no. 403) in "moist rich soil, Powhatan Swamp $\frac{1}{2}$ mile southwest of Five Forks, James City County", Virginia. As usual the Randolphs saw and prepared beautiful material of a great rarity.



Photo. B. G. Schubert

POLYGONUM HYDROPIPEROIDES, var. EURONOTORUM, all figs. from TYPE: FIG. 1, portion of plant, $\times \frac{3}{5}$; FIG. 2, summit of ochrea, $\times 4$; FIG. 3, panicle, $\times 1$; FIG. 4, portion of panicle, showing ochreolae, $\times 10$



Photo. B. G. Schubert.

POLYGONUM HYDROPIPEROIDES (typical): FIG. 4, ochrea, $\times 4$; FIG. 5, panicle, $\times 1$; FIG. 6, portion of panicle, to show ochreolae, $\times 10$

Var. BUSHIANUM, all figs. from TYPE: FIGS. 1 and 2, summit of plant, $\times 1$; FIG. 3, portion of panicle, to show ochreolae, $\times 10$

J. REPENS Michx. Local range extended inland to western GREENSVILLE Co.: open muddy border of Fontaine Creek, near mouth of Quarrel's Creek, no. 14,696. See p. 101.

J. LONGII Fernald. Local range extended inland from Coastal Plain to BRUNSWICK Co.: damp openings in woods, scarce, Moseley flat pineland, near Triplett, no. 14,586, there associated with other Coastal Plain types, such as *Hypericum setosum* L. and *Cynoctonum sessilifolium* (see RHODORA, xlv. 374, 376, 453 and 457), as well as such essentially inland plants as *Fimbristylis Drummondii* (p. 95), *Carex hirsutella* (p. 96) and *Psoralea psoralioides*, var. *eglandulosa* (p. 95).

J. SCIRPOIDES Lam. Local range extended back into the Piedmont in BRUNSWICK Co.: with the last, no. 14,587. See p. 96.

SOME VARIETIES AND FORMS OF *JUNCUS CANADENSIS* (PLATES 881 and 882).—Even after the removal from the complex *Juncus canadensis* J. Gay, as conceived by Engelmann, of *J. brachycephalus* (Engelm.) Buchenau, *J. brevicaudatus* (Engelm.) Fernald and *J. subcaudatus* (Engelm.) Coville & Blake, the remaining stiffly ascending *J. canadensis* is still a complex and highly variable plant. Generally, throughout its range, its capsule barely to but slightly exceeds the perianth and is gradually rounded at summit to a short and rather abrupt beak, but from southeastern Virginia to Georgia there occurs a very similar plant (PLATE 881, FIGS. 1-3), always with a large cyme (1-3.3 dm. long and 5-16 cm. broad), closely resembling large plants of typical *J. canadensis*¹, but with prolonged capsule tapering gradually to summit, much as in the northern *J. brevicaudatus* and the extremely southern *J. trigonocarpus*. This constitutes a well defined geographic variety which I am calling

JUNCUS CANADENSIS* J. Gay, var. **europauster, var. nov. (TAB. 881, FIG. 1-3), planta robusta 0.9-1.2 m. alta, culmo ad basin 4-7 mm. diametro; cyma 1-3.3 dm. longa 5-16 cm. alta; capitulis hemisphericis vel subglobosis multifloris distinctis vel paullo aggregatis; perianthiis 3-4 mm. longis; capsula acuta sensim attenuata valde exserta.—Southeastern Virginia to Georgia. VIRGINIA: pool in sandy barrens, Cape Henry, Sept. 23, 1933, *Fernald & Griscom*, no. 2811; sphagnous springy swales bordering Whiteoak Swamp, west of Elko Station, Henrico Co., Sept. 21, 1938, *Fernald & Long*, no. 9294; moist argillaceous pineland about 2 miles east of Stony Creek, Oct. 11 and 12, 1933, *Fernald & Long*, no. 9553; wet sandy and peaty shore, near entrance to Portsmouth Ditch, Lake Drummond, Great Dismal Swamp,

¹ See Fernald in RHODORA, xxxii. 83-88 (1930).

west of Wallaceton, Norfolk Co., Sept. 6, 1941, *Fernald & Long*, no. 13,588 (TYPE in Herb. Gray., ISOTYPE in Herb. Phil. Acad.); fresh reed-marsh and swale along Northwest River, near Northwest, Norfolk Co., Oct. 11, 1941, *Fernald & Long*, no. 13,913; sphagnous bog about 1 mile northwest of Dahlia, Greenville Co., Sept. 18, 1938, *Fernald & Long*, no. 9293. NORTH CAROLINA: drainage-ditch near Sea Level, Cartaret Co., Sept. 1, 1938, *Godfrey*, no. 6505. SOUTH CAROLINA: without stated locality, *M. A. Curtis*; drainage-ditch, 15 miles northwest of Georgetown, Georgetown Co., Aug. 25, 1939, *Godfrey & Tryon*, no. 1693. GEORGIA: swamp (at sea-level) Satella River, near Woodbine, Camden Co., Aug. 23, 1902, *Harper*, no. 1564.

In its slender, long-exserted and tapering capsule *Juncus canadensis*, var. *euroauster* suggests *J. trigonocarpus* Steud., but in all other characters, including the very large cyme, it belongs with *J. canadensis*.

Typically and through most of its range *Juncus canadensis* has a relatively short and apically rounded and abruptly short-beaked capsule, and the perianth is only 2.5—rarely 3.5 mm. long, but in the plant of Newfoundland, the northern regions of Quebec and locally southward into Nova Scotia and eastern Maine, rarely on Cape Cod, var. *sparsiflorus* Fernald (PLATE 881, FIGS. 4 and 5) in RHODORA, xxiii. 241 (1921), the perianth is 3.5–4 mm. long, much as in the extreme southern var. *euroauster*. The remaining large series which passes as *J. canadensis* presents three rather striking forms—forms because, although sometimes more abundant in definite ecological conditions, they occur wholly within the broad range of typical *J. canadensis*. In order to show their distinctive characteristics I am indicating the varieties and forms in a key.

- a. Capsule plump, gradually rounded at summit to the rather abrupt short beak. . . . b.
- b. Perianth 2.5–3.3 (rarely –3.5) mm. long; cyme (except in forma *conglobatus*), with spreading-ascending branches (rays) and branchlets, 0.4–3 dm. high. . . . c.
- c. Heads chiefly or wholly scattered in anthelate fashion along the branches of the open cyme; cyme 0.4–3 dm. high, with some elongate branches.
 Heads densely 8–20-flowered, hemispherical to subglobose. . . . *J. canadensis*, var. *typicus*.
 Heads turbinate to subhemispherical, 2–7-flowered
 Var. *typicus*, forma *apertus*.
- c. Heads all or many densely crowded into irregular glomerules or masses, globose, many-flowered, the glomerules sessile or on short rays up to 1–3 cm. long.
 Var. *typicus*, forma *conglobatus*.

- b. Perianth 3.5–4 mm. long; cyme with stiffly erect branches and branchlets, 0.3–1.5 (–2) dm. high. Var. *sparsiflorus*.
 a. Capsule slender, gradually attenuate to acute tip, long-exserted; cyme open, 1–3.3 dm. high; glomerules hemispherical to subglobose, many-flowered; perianth 3–4 mm. long. Var. *euroauster*.

J. CANADENSIS J. Gay, var. **typicus**. PLATE 882, FIGS. 1–3. *J. canadensis* J. Gay in Laharpe, Mon. Junc. 134 (1827), in large part (α); Engelm. Trans. St. Louis Acad. ii. 436 (1866—var. *longicaudatus*) and 474 (1868—var. *longecaudatus*); Coville in Britton & Brown, Ill. Fl. i. 394, fig. 955 (1896); Fernald in RHODORA vi. 35 (1904) and xxxii. 83 et seq. (1930).—Widely distributed from southern Quebec and Ontario to Georgia, Tennessee and Louisiana.

*Forma **apertus**, f. nov. (TAB. 882, FIG. 4–6), cyma 1–3 dm. longa laxa aperta, capitulis remotis turbinatis vel subhemisphaericis 2–7-floris.—Scattered in the range of var. *typicus*. NOVA SCOTIA: gravelly margin of brook, Sydney, Aug. 18, 1902, *Fernald*; roadside-pool, Yarmouth, June 22–29, 1901, *Howe & Lang*, no. 131. MAINE: Labrador Pond, Sumner, Aug. 9, 1890, *J. C. Parlin*. MASSACHUSETTS: sandy and cobbly beach of Seth's Pond, West Tisbury, Aug. 16, 1928, *Fernald & Fogg*, no. 865. RHODE ISLAND: edge of pond-hole, northwest shore of Block Island, Aug. 11, 1919, *C. B. Graves*. CONNECTICUT: ponds, Wethersfield, *Chas. Wright*. NEW YORK: woody swale east of north end of Duck Lake, Conquest, Aug. 12, 1916, *F. P. Metcalf*, no. 6164. NEW JERSEY: border of white-cedar swamp along Scotland Run, Malaga, Gloucester Co., Nov. 1, 1936, *Bayard Long*, no. 49,279 (TYPE in Herb. Gray.). VIRGINIA: quaking margin of pond-hole about 2 miles east of Bowling Green, Oct. 15, 1941, *Fernald & Long*, no. 13,914; sandy swampy ground, Chisel's Run, west of Williamsburg, July 16, 1921, *Grimes*, no. 4040; sphagnous border of shallow pond-hole $\frac{1}{2}$ mile east of Centerville, James City Co., July 26, 1941, *Fernald & Long*, no. 13,296. SOUTH CAROLINA: creek, 8 miles southeast of Columbia, Lexington Co., Aug. 8, 1939, *Godfrey & Tryon*, no. 1346. GEORGIA: bushy place, south of Kennesaw Mt., Cobb Co., July 12, 1900, *Harper*, no. 995.

*Forma **conglobatus**, f. nov. (TAB. 882, FIG. 7), culmo stricto 2–10 dm. alto; cyma 1–12 cm. longa; capitulis globosis multifloris in glomerulis subglobosis vel lobatis plerumque aggregatis, ramibus nullis vel ad 1–4 cm. longis.—Through much of the area of var. *typicus*, especially concentrated near the Atlantic coast from southern Maine to Maryland. The following are selected from a large representation. MAINE: brackish marsh, Winnegance Creek, Phippsburg, Aug. 23, 1909, *Fernald*, no. 1559. NEW HAMPSHIRE: marsh, Rye Beach, Aug. 18, 1886, *W. Deane*. MASSACHUSETTS: Plum Island, Essex Co., 1896, *A. A. Eaton*;

Kent's Island, Byfield, Aug. 18, 1904, *J. H. Sears*; Dorchester, Aug. 28, 1853, *Wm. Boott*; Sept. 3, 1882, *C. W. Swan*; damp open sandy soil near Kelly's Pond, West Dennis, Dennis, Aug. 10, 1918, *Fernald & Long*, no. 16,544; cranberry bog near beach, Hyannis, Oct. 5, 1911, *C. A. Weatherby*, no. 2833 (TYPE in Herb. Gray, ISOTYPE in Herb. New Engl. Bot. Cl.). RHODE ISLAND: Cat Swamp, Providence, Sept. 4, 1892, *J. F. Collins*; Middletown, Sept. 13, 1908, *E. F. Williams*; dryish fresh to slightly brackish borders of marshes east of Trim's Pond and Great Salt Pond, Block Island, Aug. 20, 1913, *Fernald & Long*, no. 9206; borders of brackish pools and salt marshes, vicinity of Watch Hill Pond, Westerly, Aug. 31, 1919, *Weatherby & Collins*. CONNECTICUT: wet meadow, East Windsor, Aug. 14, 1906, *Bissell*; moist field, Waterbury, Aug. 21, 1911, *Blewitt*, no. 510; fresh-water swamp near Saybrook Point, Saybrook, Sept. 7, 1908, *Blewitt*; edge of salt meadows, Fairfield, Aug. 20, 1909, *Eames*. NEW YORK: edge of salt marsh, Oceanside, Nassau Co., Sept. 20, 1917, *House*, no. 18; Westbury Prairie, Butler, Wayne Co., Oct. 5, 1916, *Metcalf & Wright*. NEW JERSEY: Hackensack Marshes, Sept., 1848, *J. Carey* (the specimen given by Engelmann an appropriate but unpublished formal name but one preoccupied in the specific category). DELAWARE: moist soil, Rehoboth, Sept. 6, 1908, *Churchill*; wet hollows in sand dunes, south of Bethany Beach and on Fenwick Island, Sussex Co., Aug. 28, 1936, *Fogg*, nos. 11,225 and 11,301. MARYLAND: wet sand, border of brackish marsh, north of Ocean City, Worcester Co., Sept. 12, 1936, *Fogg*, no. 11,429. VIRGINIA: "Ram-hole Swamp," Seward Forest, Brunswick Co., Dec. 1, 1944, *Lewis*. NORTH CAROLINA: marsh near Leechville, Hyde Co., Oct. 13, 1938, *Godfrey & White*, no. 6852. SOUTH CAROLINA: wet ground near a spring, Aiken, Oct. 8, 1866, *H. W. Ravenel* in Engelm. Herb. Junc. Bor.-Am., no. 86. GEORGIA: shallow grassy pond, alt. 250 ft., near Adams Park, Twiggs Co., Sept. 7, 1903, *Harper*, no. 1972. MICHIGAN: wet ground, Hersen Island, mouth of St. Clair R., Sept. 17, 1908, *C. K. Dodge*, no. 39; drying mucky shore of Lake Sixteen, Black Lake State Forest, Presque Isle Co., Aug. 27, 1935, *F. J. Hermann*, no. 7010 (transitional). WISCONSIN: St. Croix Co., 1861, *T. J. Hale*. ILLINOIS: Englewood, South Chicago, Sept. 2, 1893, *Churchill*. MINNESOTA: Minneapolis 1861, *T. J. Hale*; moist sandy soil, shores of Moore Lake, Anoka Co., Oct. 3, 1927, *Rosendahl*, no. 5472, Sept. 6, 1936, *Rosendahl & Rydberg*, no. 5124.

From its strong tendency along the Atlantic coast to abound at the upper borders of salt marshes forma *conglobatus* might be thought a good variety (and perhaps it is), but it also occurs in acid peats and sands and extends as far west as typical *J. canadensis*. Many specimens, difficult to place, occur, these making

every conceivable transition to the latter plant, with more open cyme, elongate rays and mostly scattered or anthelate heads. As noted in one case, Engelmann gave an appropriate but pre-occupied formal name to this plant.

Var. SPARSIFLORUS Fernald in RHODORA, xxxiii. 241 (1921). PLATE 881, FIGS. 4 and 5.—Newfoundland to the Laurentide Mts. of Quebec, south to Nova Scotia and eastern Maine, rarely on Cape Cod, Mass.

Var. EUROAUSTER Fernald, supra. PLATE 881, FIGS. 1-3.—Southeastern Virginia to Georgia.

PLATE 881, FIGS. 1-3, JUNCUS CANADENSIS J. Gay, var. EUROAUSTER Fernald: FIG. 1, portion of TYPE, $\times \frac{1}{2}$; FIG. 2, portion of glomerule, $\times 10$, from TYPE; FIG. 3, seeds, $\times 10$, from TYPE. FIGS. 4 and 5, var. SPARSIFLORUS Fernald: FIG. 4, inflorescence, $\times 1$, from Quarry, Newfoundland, Fernald & Wiegand, no. 5129; FIG. 5, glomerule, $\times 10$, from no. 5129.

PLATE 882, FIGS. 1-3, J. CANADENSIS, var. TYPICUS: FIG. 1, inflorescence, $\times 1$, from Iona Island, Hudson River, Rockland Co., New York, Muenscher & Curtis, no. 5833; FIG. 2, flower, $\times 10$, from no. 5833; FIG. 3, seeds, $\times 10$, from no. 5833. FIGS. 4-6, forma APERTUS Fernald, all figs. from TYPE: FIG. 4, inflorescence, $\times \frac{1}{2}$; FIG. 5, glomerule, $\times 10$; FIG. 6, seeds, $\times 10$. FIG. 7, forma CONGLOBATUS Fernald: two inflorescences, $\times 1$, from TYPE.

*SMILAX BONA-NOX L., var. EXAURICULATA Fernald in RHODORA, xlvi. 36 and 37, t. 811. fig. 3 (1944). Type from Norfolk, Reed?

DIOSCOREA BATATAS Dcne. To the relatively few stations recorded add one in BRUNSWICK Co.: climbing over bushes, dry thicket near old Taylor Place, Seward Forest, near Triplett, no. 14,593.

CYPRIPEDIUM CALCEOLUS L., var. PUBESCENS (Willd.) Correll. To the few recorded stations in the southeastern counties add one in BRUNSWICK Co.: rich woods, "Chamblis bigwoods", Seward Forest, near Triplett, no. 14,594. See p. 97.

QUERCUS PHELLOS L., forma INTONSA Fernald in RHODORA, xlv. 392 (1942). To the two recorded Virginia stations add one in BRUNSWICK Co.: damp thicket northeast of Ebony, no. 14,598. See p. 96.

CASTANEA NEGLECTA Dode. To the few recorded stations add two in BRUNSWICK Co.: rich woods "Chamblis bigwoods", Seward Forest, near Triplett, no. 14,597; mixed woods, Seward Forest, southeast of Ante, no. 14,698.

Here, as in the more eastern counties, *Castanea neglecta* is a straggling or loosely branched shrub of rich woodland. We have never found it fruiting, nor have we found it with *C. pumila* nor in habitats where *C. dentata* might formerly have grown. See p. 97.

THE INDIGENOUS VARIATIONS OF *ULMUS AMERICANA*.—*Ulmus americana*, the most wide-spread of the American species and the tree probably more generally recognized than any other by the layman in the East, is far from being a definite unit. As one collects material in foliage he promptly becomes aware of four different forms. These first came to my attention when, in late May, 1904, I visited my parents in central Maine, just as the fruit of the elms was dropping and the foliage well expanding. I then made collections to display the forms and have subsequently waited in vain for some of the specialists on trees to clarify the situation. In brief, *Ulmus americana* may have the leaves smooth or essentially smooth to touch on the upper surface, or the latter may be almost as harshly scabrous as in the Slippery Elm, *U. rubra* Muhl. (*U. fulva* Michx.)—see last notes in this paper. In each series the young branchlets may be pubescent or quite glabrous. In the flowering condition, obviously, these strongly marked extremes can hardly be recognized; in the foliage-material they are striking.

As early as 1789 Aiton, Hort. Kew. i. 319, 320 (1789) recognized varieties of *Ulmus americana* with scabrous or with smoothish leaves and Spach (1841) and Walpers (1852-53) took these up or augmented them; but so far as I can find, the actual type of Linnaeus has not been closely examined, to determine to which of the four variations it belongs. The photograph of it before me is wholly inconclusive. Nor can I get what I consider true geographic varieties in the species. Each of the variations appears throughout most or all of the broad range of the species, trees with scabrous or smooth leaves and with pubescent or glabrous new branchlets occurring, for example, in New England, while two or three of these trends are represented in the Gray Herbarium from Virginia, Ontario and Oklahoma. I am, therefore, treating them as forms, with the clear understanding that when the actual types of Linnaeus, Aiton and others can be studied some shifting in the application of the names may be required. It is better to have names by which the forms can be designated than to call them all one, without differentiation. As I see these forms they are as follows: